"We Seek to Serve and Not to Compete"

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MADRAS INFORMATION

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This month's cover

This issue is dedicated to Rabindranath Tagore, the immortal Poet of India, whose Centenary last month has been celebrated all over India and throughout the world.

Where the mind is without fear
And the head is held high;
Where knowledge is free;
Where the world has not been broken up
into fragments by narrow domestic walls;
Where words come out from the depth of truth;
Where tireless striving stretches its arms
towards perfection;
Where the clear stream of reason
has not lost its way
into the dreary desert sand of dead habit;
Where the mind is led forward by thee
into everwidening thought and action
Into that heaven of freedom, my Father
let my country awake

Rabindranath Tagore

The Saga of Rabindranath Tagore

[Poet, painter, author, dramatist, composer, musician, mystic, saint and seer, there was not a single aspect of the artistic life which the peerless genius of Rabindranath Tagore did not grace and embellish. The first, and so far, the only Asian to be awarded the Nobel Prize for literature, his Centenary in May this year was celebrated in India and all over the world with a wide range of programmes reflecting his many-sided creative personality. In this article, Sri Humayun Kabir, Union Minister for Cultural Affairs, pays a fitting tribute to the life and work of this great son of India]

The year 1961 marks the centenary of the birth of four great Indians—Rabindranath Tagore, Motilal Nehru, Madan Mohan Malaviya and Profulla Chandra Ray. Each one of them made great contributions to India's national development and they all shared the noble qualities of patriotism, nationalism and humanism. They believed in the freedom and dignity of the individual and held that India's greatest contribution to the world lay in emphasising these human values. Even among these resplendent figures, Rabindranath Tagore stands out as a man of extraordinary genius whose contributions to India and the world are outstanding.

New awakening

Tagore was fortunate in both the time and the place of his birth. The advent of the West had disturbed the placid waters of Indian life and a new awakening was seeping throughout the land. Its initial impact had dazzled the Indian mind and so impressed some of the early reformers that they at times seemed to be blind imitators of the West. By the time Tagore was born, the first uncritical admiration for the West had worn off and there was a more balanced appraisal of the values of the West. Simultaneously, there was increased knowledge and regard for the values of the East. The place of his birth was equally opportune. Bengal had felt the impact of the West earlier and more vividly than perhaps any other part of India, and in Bengal the stirrings of new life were most marked in Calcutta. The meeting of East and West on India's shores was thus for Tagore both a fact and an ideal.

Family circumstances

The circumstances of his family also helped in the flowering of Tagore's genius. Originally from East Bengal, the family became rich and prosperous during the later Mughal days. The prosperity became even greater after the advent of the British. Co-operation with the ruling power brought it status, wealth and culture and also attracted the disapproval of the orthodox. Inter-dining with the Tagore family invited social disapproval, inter-marriage, ostracism. Conscious of its wealth and talents (it had already produced three generations of exceptionally able men when Tagore was born) the family reacted with proud unconcern and ignored many of the social taboos of the day.

Moved by deeper values

The family had however for generations been moved by the deeper values of Indian life. Tagore's grandfather was one of the pioneers of Western education and a friend of Raja Rammohan Roy. His father, a deep student of Indian philosophy and Islamic mysticism, began his day with recitations from the Upanishads and Hafiz. Tagore was thus born in a family which was steeped in the traditions of ancient and medieval India and yet responsive to the currents of the modern West. A deeply religious atmosphere free from adherence to forms and rituals created an ideal background for the flowering of his universal mind.

Many-splendoured genius

We can only hint at his many splendoured genius in this account. The world rightly honours Rabindranath Tagore as one of the greatest literary figures in history. His writings include more than one thousand poems and two thousand songs in addition to a large number of short stories, novels, dramatic works and essays on diverse topics. As a writer of lyrics and songs, he has rarely been equalled and perhaps never surpassed. As a short story-writer, his rank is among the first three or four masters of the craft. As a novelist and playwright, he has achieved for himself an honoured place in the world of letters. As a literary critic, he has given evidence of rare insight and deep sympathy with the work of men who differed from him widely in tradition and temperament. It is thus not surprising that his works should be translated into all the major languages of the world and that they should bring joy, solace and strength to countless millions.

The diversity of his literary work is amazing; but literature in its widest sense could not exhaust his energies. He was a musician of the highest order and not only composed songs but set them to music. He started as a traditionalist but very soon the range of his musical composition expanded till it incorporated elements from western music and fused them with his eastern background. With more than two thousand songs that express every nuance of human feeling and every mood of nature in her infinite variety, he is undoubtedly one of the greatest composers and musicians that the world has known.

Creative Painter

Tagore took to painting when he was almost 70 and yet produced within ten years almost 3,000 pictures. They broke sharply from prevailing Indian styles and explored the unconscious and sub-conscious levels of the mind. Some regard his work as a complete breach with the Indian tradition and yet many competent critics have described his as one of the most significant and creative painters of modern India. His affiliation with primitive art on the one hand and with some of the *avant garde* on the other is only one indication of the sweep and range of his genius.

Educational Ideas

Tagore was an artist par excellence, and in addition he made notable contribution to religious and educational thought, to politics and social reform, to moral regeneration and economic reconstruction of India and the world. He not only thought deeply and creatively on all these topics but he also set his hand to realise in practice what he preached. The educational ideas which inspired his school at Santiniketan have deeply influenced all modern educational thought in India. His programmes of economic, social and political reconstruction of the village through the co-operation and self-help of villagers have set the pattern for programmes of reconstruction of national life in contemporary India. He travelled far and wide to restore India's contacts with the outside world and laid the foundation on which free India has based her policy of friendly relations with all peoples of the world.

Universal Man

Tagore's deep feeling for the unity of man made him realise that inter-dependence of peoples and countries rather than their independence must be the principle of life and progress today and tomorrow if the world is to survive the challenge of modern Science and Technology. He was one of the first to recognize and proclaim that the old divisions of nation and race had become outmoded in the modern age. Today the world is one and our sympathies and loyalties must be expanded to recognize this fact. Steeped in the age-old traditions of the East, an inheritor of the rich cultural heritage of ancient and medieval India, he was simultaneously a modernist who welcomed the values proclaimed by the West. In a word, Tagore lived and worked for the realisation of the ideal of Universal Man.

Indian Supersonic Aircraft

India is the first Asian Country and one among the few European countries to make the kind of supersonic fighter aircraft now being designed and developed at the Hindustan Aircraft Factory in Bangalore. The only other countries to develop similar aircraft are the United States, the Soviet Union, the United Kingdom, France and Sweden.

According to a spokesman, the Hindustan Fighter HF-24 incorporates the latest thoughts and practices to enhance its performance according to the most modern standards. It has also the most up-to-date devices to insure maximum safety for a pilot. If something goes wrong with the aircraft when it has attained extreme altitude, a series of automatic operations will enable the pilot to land safely even though he may have become unconscious soon after ejection at a height of 40,000 to 50,000 feet.

HF-24 is a twin-engined aircraft powered with Bristol Orpheus engines. The manufactur of the engine itself will be undertaken at HAL which has already taken up the manufacture of Rolls Royce Dart air engine which will power the first Indian built transport aircraft now being developed at the Air Force Base at Kanpur.

Green Grasses in Cattle Feed

Dr. D. PATTABHIRAMAN, *Director of Animal Husbandry*

Cattle management is concerned with the attempt to exploit inherent potentialities in the animals and the greatest factor in their management therefore is feeding. The purpose of maintaining these animals is to obtain from them animal products like meat, milk, etc., which are of considerable use to man. In order to achieve this, in addition to normal maintenance, sufficient quantity of food should be given to the animals.

Animals require optimum nutrition to yield their maximum capacity. It is stated that by better feeding alone, it is possible to increase milk yield by about 50 per cent. The rations fed to animals should be nutritive, palatable and easily assimilable. Apart from concentrates, the requirements of fodder as common feed to animals should be fully utilized. The feed and fodders selected should have nutritive value such as leguminous types. Grazing areas are most essential for improvement of cattle and every breeder should maintain grazing areas in his lands and they should be fenced all round. Instead of reducing grazing areas, they could be improved by proper bunding according to the slopes to conserve rain water, occasional ploughing and sowing of pasture grasses and periodical removing of weeds.

Fodder Development

Under the Key Village Scheme in the State, fodder development work has been undertaken since 1958–59. Six 100-acre improved pasture plots have been established in the livestock farms of this State, from where seeds and seed materials are supplied to the Key Village areas, since the pre-requisite for raising fodder crops is the supply of seeds and seed materials. From these pasture plots seeds like kolukattai, sunhemp, lucerne and grass slips of guinea grass and other nutritive grasses are procured and supplied to the agriculturists at 50 per cent of the cost. The ryots are also encouraged by suitable subsidies to grow fodder crops like sunhemp in compact areas.

Ten acre pasture demonstration plots have been established in 10 Key Village Blocks. These plots have been established in private holdings with proper fencing, bunding, seeding, dividing them into compartments for proper inter-cultivation. They are to be maintained for 5 years and 50 per cent of the total cost of establishing these demonstration plots, subject to certain conditions, is paid as subsidy. These demonstration plots serve as models to the ryots in the area for proper maintenance of their pasture. Apart from various items of work already taken up, it is proposed to establish good pastures of 500 acres and to subsidize the cultivation of nutritious fodder crops and grasses like lucerne, berseem, guinea grass, etc., under irrigated conditions.

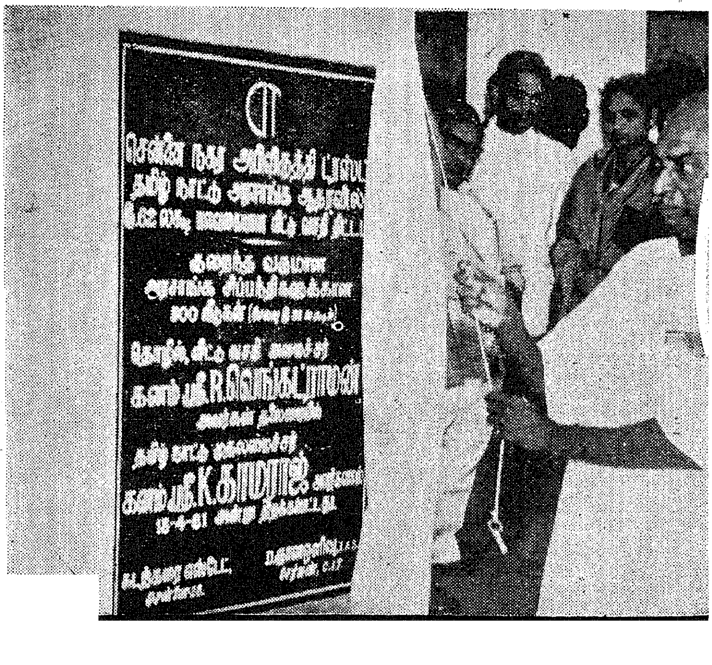
Green Grasses

Green grasses are the best available feed for cattle. They are relished and specially for cows in milk and for growing young stock it is most essential. The cost of feeding with concentrates can be considerably reduced if green grass is made available by a source of constant supply. As greens contain all essential vitamins, if fed to animals in the morning, one can get good quality milk in the evening, since the quality of milk depends upon the feed given to the animal.

For information and adoption cultivation methods of a few grasses are mentioned below :—

Guinea grass: This is a perennial fodder grass which is commonly and abundantly cultivated under irrigated conditions. This thrives well under our climatic conditions unlike other grasses and grows well even in shady parts of land. Coconut gardens, etc., can also be made use of

Chief Minister Kamaraj inaugurated recently the Foreshore colony of houses for Non-gazetted Government Officers at Santhome, opposite Hotel Oceanic.



A section of the large gathering that was present at the inauguration of the Foreshore colony at Santhome.

for cultivation. It grows in height up to 4′ and even higher and is not deep rooted. It can be grown both by seeds and slips, but cultivation by slips is the best method.

The land for cultivation of guinea grass should be high level area which can be irrigated and drained easily. It should not be water-logged. Just as for cultivating any crop, the land should be well ploughed in dry condition, manured heavily, i.e., 40 cart-loads of farm yard manure per acre and divided into convenient plots for irrigation. Planting in line 2½′ apart will be ideal. Moisture should be made available always by irrigating periodically once in 4 or 7 days. The first cutting will be available after 2½ months and then four more cuttings will be available in a year with an yield of 60,000 lb. to 100,000 lb. annually. When once planted, it can be continued for a number of years.

Periodical Weeding

Periodical weeding, hoeing and manuring of the grass-land is essential. Liquid manure, i.e., fresh cow dung should be diluted during irrigation after each cutting. Under good soil and well irrigated conditions the yield is heavy. Cutting should be close to the ground. Good silage and hay can be made of this grass. Cattle relish it. It is palatable and easily digested. Madurai Municipality has been cultivating this grass for the last 25 years and has been selling it to the public. Other municipalities also cultivate this grass but not on a large scale.

A scheme has been recently taken up by the Madras Corporation for cultivation of fodder grasses under Sewage Irrigation Scheme. Other grasses such as buffalo, manipier and khoden are also cultivated under simliar conditions.

Berseem Clover

Berseem is an annual white-flowered clover introduced into this country from Egypt, Though its native tract is Syria and Egypt, it has adapted admirably well and is now the chief commercial forage crop of Punjab and U.P. At present it is grown in South India at the Livestock Research Station, Hosur Cattle Farm, on a large scale. This crop is pre-eminently suited for irrigated tracts. It is a cold weather rotation crop and like other legumes enriches the soil. It is an annual crop of seven months' duration. The fodder is very rich in protein and is relished by all kinds of livestock. The early sowings of berseem can be carried out from the end of September and continued up to the middle of November. Large quantities of berseem green fodder can be had from the middle of November in four or five cuttings till May. It is good for milch cattle and is found to increase the milk yield.

Green berseem fodder contains up to 2·3 per cent of digestible protein and 10 per cent total digestible nutrient. Work bullocks can be maintained on berseem even when doing hard work and receiving no added concentrates. A small quantity of dry roughage however is advisable. Since it is a leguminous crop it enriches the soil by virtue of the nitrogen fixing bacteria present in the root nodules. It also forms a very good rotation crop with other fodder crops like cholam, maize and teosinte which are raised during the monsoon period.

The right soil

Berseem requires a well-drained loamy soil. It can come up well even in heavy soils, provided there is proper drainage facilities. The land is prepared giving 5 to 6 ploughings on application of 20 cart-loads of cattle manure and 100 lb. of super phosphate per acre. Beds and channels are formed. The seeds are mixed with sand and sown in the beds and covered with hand rake. Then the beds are flooded. The seeds will germinate in a day or two. The seed rate used is 15 to 20 lb. per acre. But in practice a higher seed rate of up to 30 lb. is found to give very good crop. Though the cost of the seed is high it is better to go in for a higher seed rate to secure a good crop return. The seeds are soaked in water for six hours and kept overnight. Then the sprouted seeds are sown well in the puddled and levelled plots after draining the water and the crop is treated as a garden crop and irrigated once in six days.

Light irrigation needed

If the crop is to be raised in a new tract, it is necessary to inoculate the soil with berseem bacterial culture at the time of sowing. This culture is availabe from the Agricultural Chemist, Coimbatore. It may be enough to take some soil, say half a bag from plots where berseem is grown and apply it just before sowing in the plots where berseem is to be raised. To start with, it is better to raise the crop in small areas and once the crop is established the area can be increased in subsequent years.

The crop requires constant light irrigation once in five to six days. It does not stand water stagnation. If there is too much moisture, the crop turns yellow and stunted. It is ready for cutting in 60 days after sowing. Subsequent cuttings can be taken up every 25 to 30 days. It may be necessary to give one hand weeding after the first or second cutting. After taking one or two cuttings, application of well-rotted cattle manure in liquid form mixed with irrigation water is found to increase the yield. In all, the crop will give four to five cuttings in a season.

The last cutting

After the last cutting the crop will give as cut only shoots with flower buds and there may not be much of forage. At this stage, the crop should be allowed for setting seed. When the seeds mature, the vines will dry off. Care should be taken to collect the dried vines with flower heads then and there. If they get soaked in rain, the seeds will very easily get germinated. The vines are dried up well and thrashed by passing a roller or beating with sticks. The seeds are cleaned and stored for use in the next season. On an average this crop will give 60,000 lb. per acre in four to five cuttings. In small areas when the crop is raised with proper care, timely irrigation and weeding, it is found to yield as high as one lakh lb. in five cuttings in a season. The cost of cultivation of this crop per acre is about Rs. 200.

Sunhemp

Sunhemp is a leguminous plant, rich in albunicids. Light loamy soil to heavy clay soil with suitable moisture conditions, suits the growth of sunhemp. This is a quick growing plant with a growth phase of two months. Usually in paddy growing areas like Thanjavur district, the only available cattle fodder is paddy straw, which possesses low nutritive value. There is therefore a need to have other suitable supplementary fodder.

It has been found that growing of sunhemp in paddy growing areas after the paddy crop, has been useful. Just before the harvest of paddy, the sunhemp crop can be grown. The seeds are soaked in water overnight, the water is drained the next morning, kept moist till the evening, when they begin to sprout out. The sprouted seeds are sown among the standing crops of paddy, just a few days before harvest. The sunhemp crop appears soon after the removal of the paddy crop. The crop comes to flower two months after sowing, when a characteristic aroma is developed which is very much relished by cattle.

The crop is harvested just when it is in full bloom, before it pods after harvest and after drying, is bundled and stocked with paddy stocks, so that a mild fermentation takes place in the stock. The cattle are fed both sunhemp bundles and paddy straw together. The paddy straw provides the bulk and the sunhemp the nutrients deficient in the paddy straw. The milk yield of animals fed on this mixed feed is well over the yield of animals fed on paddy straw alone. Aroma and the tenderness of this crop feed, increase the palatability. The yield of sunhemp per acre is about 1,500 to 2,000 lb.

Lucerne

Lucerne is a perennial crop. Once cultivated, it continues to produce for a number of years. This crop is believed to be the native of South-Western Asia, where the climate is characterised by cold winters and hot summers. It is also grown successfully under a wide range of climatic conditions indicating a remarkable adaptation to various climates and soils. This has high nutritive value as it contains high percentage of digestible crude protein. This is a very important forage for livestock.

The crop is sown on a medium well-drained soil in the months of October to November in a well prepared fine seed bed in rows of 1 to $1\frac{1}{4}$ feet apart. As it is difficult to get a good stand it is very necessary that the seed bed is prepared well both before and after sowing. The weed growth should be reduced, as they constitute the enemy for the growth of lucerne. To get high yields, the crop should be allowed to grow and flower and then cut. The subsequent cuttings should also be taken up, when the crop is in the desired stage after about a month. Repeated cuttings at shorter intervals should be avoided. It may be possible to have 1,000 maunds of green forage per acre in 10 cuttings during the year.

A view of the Foreshore colony at Santhome.

Use of New Methods in Agriculture

C. R. SESHADRI, *Joint Director of Agriculture (Planning and Development).*

There is greater realisation now than ever before that the objectives of the Five-Year Development Plans drawn up for the country could be fulfilled only by increasing agricultural production. To ensure proper nutrition to the growing population, provide the raw materials needed for expanding industries and accumulate adequate surplus for export, the production of foodgrains and their essential commodities has to be considerably stepped up.

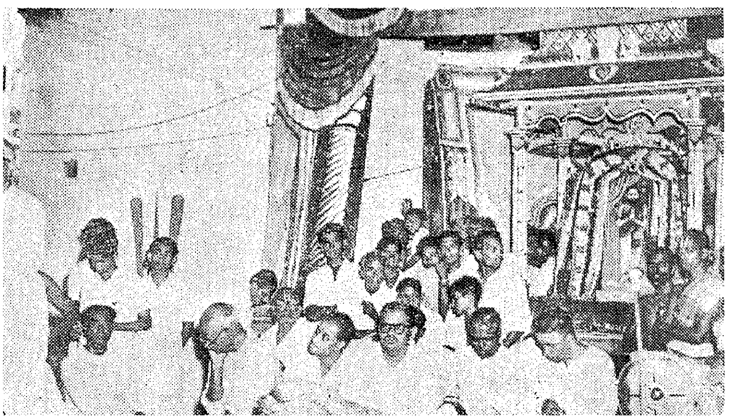
Agricultural production holds the key to the country's progress in all spheres. It is for this reason emphasis has been laid on agricultural development in the Third Plan. Realising that the present rate of increase in agricultural production would not help the country in reaching self-sufficiency within a reasonable time, the Planning Commission has considered it expedient to fix comparatively high targets of production for foodgrains and other important commodities like cotton, oilseeds, sugarcane, coconut, arecanut, cashewnut, etc.

Intensive Cultivation

In recent years, by the adoption of intensive cultivation methods, some of the progressive farmers of this State have practically demonstrated the potentiality for securing very high yields comparable to the best elsewhere. This clearly shows that the present level of yields for most of the important crops could be appreciably increased.

Cultivation, irrigation, manuring, seeds and plant protection play a vital role in increasing crop production and farmers can usefully follow recent research findings and experiences in regard to these aspects in their efforts to secure increased output of crops.

Kambar Vizha was observed recently with great enthusiasm at Therezhundur, birth place of the immortal poet of Tamilnad. In the picture, Home Minister Bhaktavatsalam is seen addressing the conference.



The preparatory and after-cultivation of the soil should be as thorough as possible. Where virgin lands and fallows are proposed to be put under crops, deep ploughing with tractors would be very essential. Soil conservation measures such as levelling, contour bunding and bench terracing should be carried out according to modern techniques. This would effectively check soil erosion and conserve rainfall to the best advantage of crops. Deep ploughing would be particularly beneficial to crops like sugarcane and cotton. Systematic inter-cultivation should also be carried out for all crops as this practice not only keeps down weed growth but also conserves soil moisture.

Irrigation

Since irrigated crops generally give high yields, every effort should be made by farmers to extend the area under irrigation. For this purpose, irrigation facilities provided under new projects should be properly utilised. Other incentives provided for tapping underground water resources by digging wells and bore-wells should also be taken full advantage of. In areas with water bearing sandy strata, filter point tube wells should be installed to provide necessary irrigation. Thus all possible means of augmenting water-supply to crops should be explored.

Right Manuring

Soils in most parts of the State are of low fertility due mainly to continued cropping without rotation and manuring and constant erosion by rain. Adoption of efficient crop rotations, application of optimum doses of manures and carrying out soil conservation measures would alone help in maintaining their fertility. The organic matter content of most of the soils is very poor and as such the farmers should endeavour to rectify this deficiency by the application of bulky organic nanures like cattle manure, compost and green leaf. Not only should the cattle manure be properly preserved before application to the soil but all other wastes should be converted into compost. Night soil compost being very valuable, it should be increasingly used.

Crops and Shrubs

Since present resources cannot meet even a small fraction of actual needs, raising green manure crops and shrubs by utilising available waste lands and field bunds should be extensively taken up. This useful practice should be exploited to the utmost extent possible to achieve

self-sufficiency in organic manures. Green manuring is of special value to crops like paddy, sugarcane and coconut. The paddy grower should utilise the off-season fallow and even take to border cropping with Sesbania to secure requisite quantity of green leaf manure.

Short duration Sunhemp should be grown between rows of sugarcane in the early stages of its development, to secure adequate quantity of organic matter. Similarly raising an inter-crop of Kolinji or planting of Glyricidia on the borders of coconut gardens would help in securing enough organic manures for the palms. An all-out effort to extend the practice of green manuring should be made by all farmers.

Use of Fertilisers

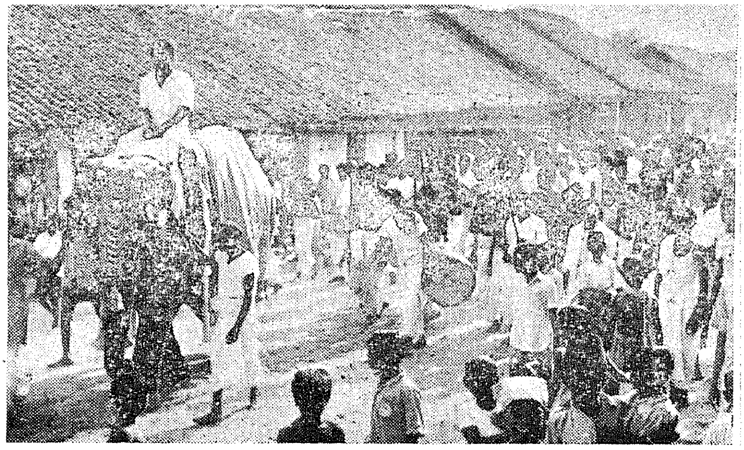
Application of ammonium sulphate and super phosphate in conjunction with green manures has been found to increase paddy yields. The phosphate is best applied through the preceding green manure crop. The nitrogenous fertilisers should be given in split doses, i.e., half-at planting and half before flowering. Application of nitrogenous fertilisers to dry millets under conditions of assured rainfall has been found to enhance yields considerably. This practice should therefore be extended to large areas. Use of 200 to 250 lb. nitrogen both in the organic and inorganic forms for sugarcane has been found very beneficial.

Groundnut crop gives good response to application of phosphate and potash. Cotton too responds well to application of nitrogenous fertilisers at 30–45 lb. per acre in two doses at sowing and end formation stage. Application of NPK fertiliser to coconuts besides increasing nut production, also helps in maintaining the health of the palms.

Improved Strains

Through intensive selection and breeding, improved strains of the important crops have been evolved to suit the varied conditions of their cultivation in this State. Among the recent releases may be mentioned the blast and saline resistant paddies, the fodder-cum-grain and striga resistant cholams, hybrid cumbu and long staple-fine quality Karunganni cotton. Other notable introductions are Anabe-Shahi grape, Ranchi papaya, Chinese Sweet potatoe and Valenca tapioca. Their extended use will greatly increase the acre yields.

Adoption of optimum seed rate or spacing is yet another important aspect requiring attention. Use of 15,000 three-budded setts and planting them in rows 5 links apart have been found to ensure high yields of sugarcane. Adoption of wider spacing ($1\frac{1}{2}'$-$2'$) between rows and narrower spacing ($3''$ to $6''$) in the rows for groundnut crop results in high production. In cotton, too, sowing to optimum spacing is found very essential.



The festive procession with caparisoned elephant and all that was taken out in the streets of Therezhundur in connection with the recent Kambar Vizha there.

Block planting of coconuts is best done allowing a spacing of 25′ between the palms. However, for single row plantings, 20′ spacing would be adequate. Coconuts can also be raised successfully in saline and submerged areas, by planting grown up seedlings in raised mounds or strips. In the same manner cashew plantations can be properly established even in arid regions by planting them in sunken mounds.

Another important measure that should receive the special care of the farmer is pre-treatment of seeds. This not only ensures proper germination but also prevents incidence of diseases on the crop later on. Such pre-treatment is of special value to paddy, cholam, sugarcane, cotton and groundnut.

Pest Control Measures

The border pests of paddy and sugarcane, the hairy caterpillar on groundnut, the boll-worm on cotton and the leaf-eating caterpillar on coconut usually take heavy tolls. Prophylactic spraying against the paddy borer and mechanical methods of control for the sugarcane borers have proved effective. The groundnut hairy caterpillar is best tackled with BHC. 10 per cent dust when they are four or five days old. Pests of cotton can also be effectively controlled by adopting a systematic schedule of spraying with Folidol and Endrin. For the coconut caterpillar, release of parasites bred at the five Parasite Breeding Stations in the State will prove successful.

Improved techniques when carried out over large areas would contribute substantially to increased agricultural production in this State. By this, the farmers would not only benefit themselves by the increased outturn per acre but also help the country to march forward. They should put forth greater effort at intensive cultivation of crops on the right lines and help the State to maintain its lead in agricultural development. The farmers of the State should wake up to this great responsibility.

Labour Welfare in Industry

R. SESHADRI, *Personal Assistant to the Commissioner of Labour*

The concept of Labour Welfare is familiar in its terms but is not easy to define. An ordinary and straightforward meaning of the term is "efforts to make life worth living for employees". The Royal Commission on Labour stated that "it is a term which must necessarily be elastic, bearing a somewhat different interpretation in one country from another, according to the different social customs, the degree of industralization and the education of the worker". It is clear that the question is subjective and should be taken to mean as anything done to a worker to better his physical, intellectual and economic needs.

Whatever be the terminology used and the scope of its meaning, the importance of Industrial Welfare is fast gaining ground as it creates a healthy and congenial atmosphere in the workplace and aims at keeping the labour force stable and contented.

Important Factor

Labour forms an important factor in production. In a fast developing economy where progress has necessarily to be assessed in relation to production, Labour Welfare measures and schemes are important since they are designed to get the best out of labour. In the First Five-Year Plan, it was observed "in order to get the best out of a worker in the matter of production, working conditions require to be improved to a large extent. The worker should at least have the means and facilities to keep himself in a state of health and efficiency. This primarily depends on adequate nutrition and suitable housing conditions. The working conditions should be such as to safeguard his health and protect him against occupational hazards. The workplace should provide reasonable amenities for his essential needs".

Elementary benefits

In its early days, the Labour movement was not well organized and it took quite some time before elementary benefits like weekly holidays, half-an-hour's rest interval, payment of wages after wage period, safety from machines, proper ventilation and sanitation were provided. Anything done by an employer to the workers outside the scope of statutory requirements, is a voluntary effort at Labour Welfare and has its own benefits. Statutory Welfare, by efflux of time, becomes a matter of right and is less appreciated than voluntary welfare services.

The working conditions of workers were improved gradually through various legislations. It would be interesting in this connection to trace the growth of industrial legislation in India. As in England, it was the miserable lot of working children that first drew the attention of the Government.

Ban on child labour

The first Factories Act was passed in 1881. This Act banned the employment of children under 7 years of age and also laid down that children between the ages of 7 and 12 could work up to a maximum of 9 hours a day. The Act did not regulate or specify the working hours for the working persons above the age of 12. As this Act applied only to Factories with 100 or more workers, there were only nine factories that came under the purview of this Act in the then Madras Presidency. The Deputy Commissioner of Police in the City of Madras and the District Magistrates in the districts were the Inspectors of Factories to enforce the Act.

The second Factories Act which came into force in 1891 gave increased protection to children and women labour as well. The working hours for children were reduced from 9 to 7 hours a day. It was the Factories Act of 1911 which marked a great step forward in the improvement of the lot of workers. It was in this Act that provisions governing health and safety were introduced. The Act also provided for periodical official inspection of factories to ensure the observance of the various safety measures.

Leave with wages

The first Factory Inspector in Madras was Mr. Henry Thomas Walters and was appointed in July 1912. The number of factories in 1912 had swelled to 268 and provided employment to 65,191 workers. Successively the Factories Acts of 1922, 1923 and 1926 were passed which limited the maximum working hours of a worker per week and also brought any workplace with 20 or more workers under their purview.

A comprehensive Act was passed in 1934 to implement the recommendations of the Royal Commission on Labour. This Act paid due attention to working hours, health and safety. By and by, various amendments and fresh legislation were enacted, and were made applicable even to small power factories with ten or more workers. For the first time in the history of Factory Legislation provision for leave with wages was made in the 1945 Factories Act.

I.L.O. Standards

The current factory legislation is the Act passed in 1948 and is based on the standards laid down by the International Labour Organization. Provisions for licensing of factories, approval of plans for construction of factories, good ventilation, sanitation, lighting, provision of drinking water and safety precautions of higher standards were introduced. On the welfare side, many additional facilities like rest sheds, canteens, first aid outfit, ambulance room, creches, etc., were introduced. Welfare Officers had to be appointed by factories employing 500 or more workers. Consequent on the introduction of the new Factories Act, the employment position considerably increased. The number of factories rose from 4,167 in 1945 to over ten thousand in 1950.

Workmen's Compensation

The earliest measure of social security is the Workmen's Compensation Act of 1923 which provides for payment of monetary compensation to disabled workmen, and the heirs or dependants of deceased workmen. This was followed by a number of important legislations designed to secure improved working conditions, the right of collective bargaining, security of employment, provident fund, insurance and maternity benefits and so on. The Minimum Wages Act, the Madras Shops and Establishments Act and the Plantations Labour Act are among the more important of the measures passed in recent times for promoting the all-round well-being of workers.

After the formation of the International Labour Organization, its conventions became the guiding factors in regulating the working conditions in industrial establishments.

E.S.I. Benefits

With the advent of the Employees' State Insurance Act, which is now extended to most of the districts in the Madras State, a worker is assured of free medical care and attention. Hospitals exclusively for workers with provision for specialist attention have been established. The Employees' State Insurance Corporation is acquiring sites and putting up buildings for hospitals in all centres. The medical benefits are also to be extended to the families of workers.

The Government of India, through the Central Board of Workers' Education, has opened a regionaloffice at Madras, under the care of a Regional Administrative Officer assisted by Teacher-Administrators to impart education to workers drawn from various factories.

Housing facilities

One of the essential measures of welfare is the provision of adequate housing facilities for workers. This aspect of Labour Welfare has been engaging the attention of the Government of India and the State Government. A scheme popularly known as the Subsidised Industrial Housing Scheme has been launched in Madras State with the assistance of the Government of India in the shape of loans and subsidies. Under this Scheme, State Governments and the Statutory Housing Boards are granted 50 per cent of the approved ceiling cost of buildings as loan and the remaining 50 per cent as subsidy. Private employers and co-operative societies are also eligible for loans and subsidy under this Scheme. Under the ægis of this Scheme the Madras Government have already constructed nearly a thousand houses at Sembium and Errukkancherry at an estimated cost of about Rs. 25 lakhs.

During the Second Five-Year Plan period, the Government of India allocated a sum of about Rs. 55 lakhs for undertaking the construction of houses for industrial workers in Madras State. Out of the 1,700 houses sanctioned under this Scheme, 1,098 houses have already been constructed, and the remaining houses are well on the way to completion. Private employers have also schemes for construction of houses for workers and 10 such schemes for the construction of 552 houses at an estimated cost of Rs. 9·21 lakhs have already been approved by the Government.

Plantation Labour

The introduction of the Plantation Labour Act of 1951, considerably improved the working conditions of the workers in Plantations. As in the Factories Act, necessary provisions have been made for the supply of wholesome drinking water, suitable medical aid, educational facilities,provision of canteens and adequate sanitary convenience. The Plantation Labour Act also provides for phased programme of compulsory housing for workers by the owners of Estates.

Welfare of Labour is really one aspect of the fulfilment of the directive principles of our Constitution, namely, establishment of a Welfare Society in which the right to work and to enjoy the fruits thereof are assured to every citizen. In the past decade, much effort has been made in this direction. More remains to be done. But the measure of the success already achieved is proof of society's sympathetic understanding of the needs of the working classes and its responsibility.

Progress at Thanjavur School for Juniors

[The Government Junior Approved School at Thanjavur has registered encouraging results in its efforts to convert vagrant children and junior offenders into useful citizens. In the absence of the opportunity for reform that schools like the one at Thanjavur provide for the 'Junior' to correct himself, there is every danger of his remaining a chronic offender. The school report presented in this article gives an account of good results achieved in the school and should provide happy reading for those interested in the rehabilitation of society's unlucky children]

The year started with 484 boys on the rolls. 136 boys were by direct admissions from courts. Of them 32 boys were placed under offences, 9 boys as uncontrollables and 95 boys as orphans and destitutes. 101 were received by transfer from the Junior Approved School, Ranipet, 19 from the Senior Approved School, Tattaparai, and one from the Junior Approved School, Thiruchitrambalam. The year closed with 594 boys on the rolls. 119 pupils were discharged on expiry of their periods of detention.

Twelve boys were coached and presented for the E.S.L.C. Public Examination in March 1960 and six of them came out successful. 11 boys appeared for the same examination in March 1961. Two pupils sat for the Madhyama Examination in Hindi and passed in second class. Five pupils took the Hindi Prathamic Examination and all of them passed, one securing first class. Two boys appeared for the S.S.L.C. Public Examination in March 1961 through the Veeraraghava High School, Thanjavur and four attended High School classes at St. Antony's High School.

The Minister for Revenue and Health, Sri Manickavelu, presided over the School Day celebrations of the Government Junior approved School, Thanjavur, and distributed prizes recently. In the picture the Superintendent of the School is seen reading the report.

Vocational training was imparted to pupils in carpentry, weaving, tailoring, spinning, masonry, laundering, hair dressing, book-binding, brass band, gardening and poultry keeping taking into consideration the attitude, heriditary skill and environmental conditions of the pupils. Boys were coached and sent for various Government Technical Examinations every year. During the year under report 15 boys appeared for such examinations. Out of the two pupils sent for music (lower grade), one passed. Out of the seven sent for drawing (lower grade), four passed.

Compulsory physical training is imparted to all the pupils daily in the mornings for half an hour. In the evenings they play organized games like football, volley ball, hockey, etc.

Religious Instruction

The need for religion of the pupils was well understood and every effort made to instil in their growing minds the idea of God and the need to account for every action to Him. Religious and Moral instruction classes were conducted by teachers of different faiths. Thevaram and Thiruppugazh classes were conducted by Sri Manickam Chettiar. Rev. Father S. Arulayya imparted religious instruction to Christian pupils. Swamy Sivananda Srinivas of the Divine Life Society conducted monthly Bhajans. Hindu boys were taken to the Sri Brahadeeswarar Temple every Thursday regularly. Christian and Muslim pupils were taken to the Church and Mosque on Sundays and Pridays respectively.

Wholesome food

Nutritive and wholesome food was prepared in individual kitch ns and given to the boys. Boys were served with variety of dishes of their choice within prescribed rations. On festival days special dishes were served.

The health of the pupils was very good during the year mainly due to the care bestowed upon the boys by the Medical Officer of the institution Dr. J. D. Kanakaraj and his staff.

The school owns a silent film projector. Films of educative value were obtained from the Film Library, Madras, and screened periodically. The School's Scouts and Cubs took part in all the functions organized by the Bharat Scouts and Guides Local Association, Thanjavur and in the Annual Scout Camp held at the Thanjavur Water Works Compound recently, the School Auxiliary Cadet Corps functioned efficiently.

Study Circle

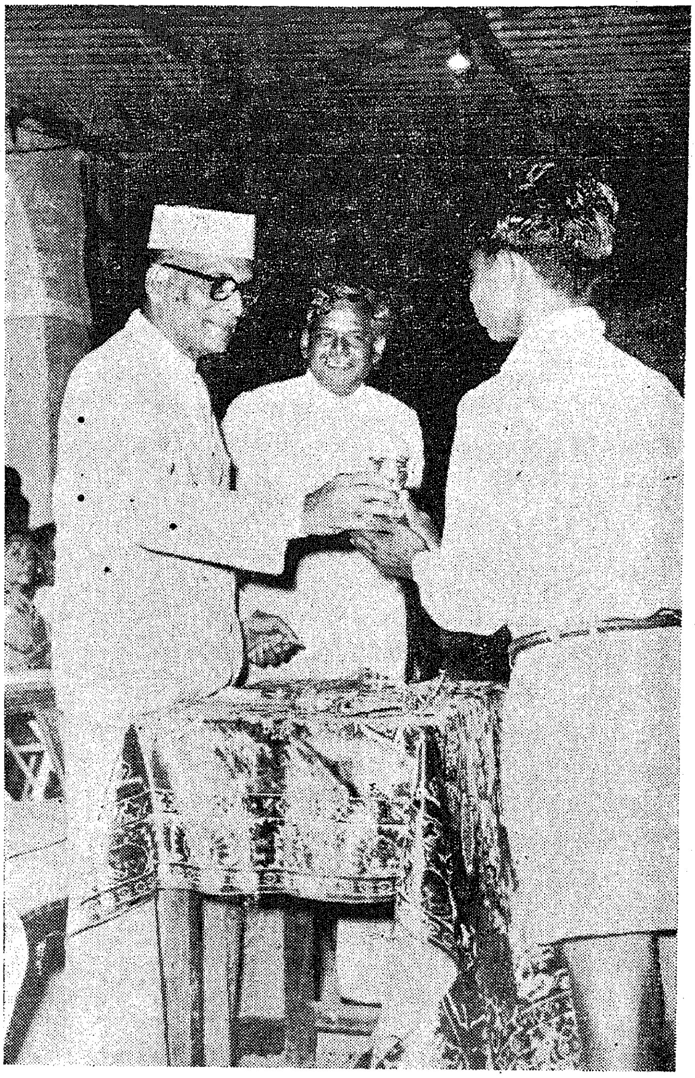
The boys were periodically subjected to study and analysis with special reference to their family history and environmental conditions. Each pupil was treated with appropriate measures or methods, discussed and decided on the lines suggested by Dr. G. D. Boaz, Honorary Adviser in Psychology to the Department of Approved Schools and Vigilance Service, Madras. Such meetings of the psychology study circle were held quarterly and dealt with difficult problems and effected possible treatment. Courts of Honour were regularly held by the Housemasters and the general discipline of the school was good. The boys were able to gain knowledge of the rudimentary principles of good citizenship through the Panchayat System. Sri M. Noorudin, the Psychologist, visited the school periodically and gave advice on problem of children.

Building Character

All the festivals, religious and national, were celebrated by the boys and staff. General Thirukkural classes were conducted every Monday for both pupils and staff. Verses from the works of great poets like Avvaiyar were recited by pupils class-wise. This general assembly class encouraged cultivation of memory, improved general knowledge and went a long way in building character besides imparting moral instruction.

The school participated in the All-India and Industrial and Commercial Exhibition, Madras, and articles manufactured by boys in Carpentry, Weaving, Tailoring and Binding sections were exhibited.

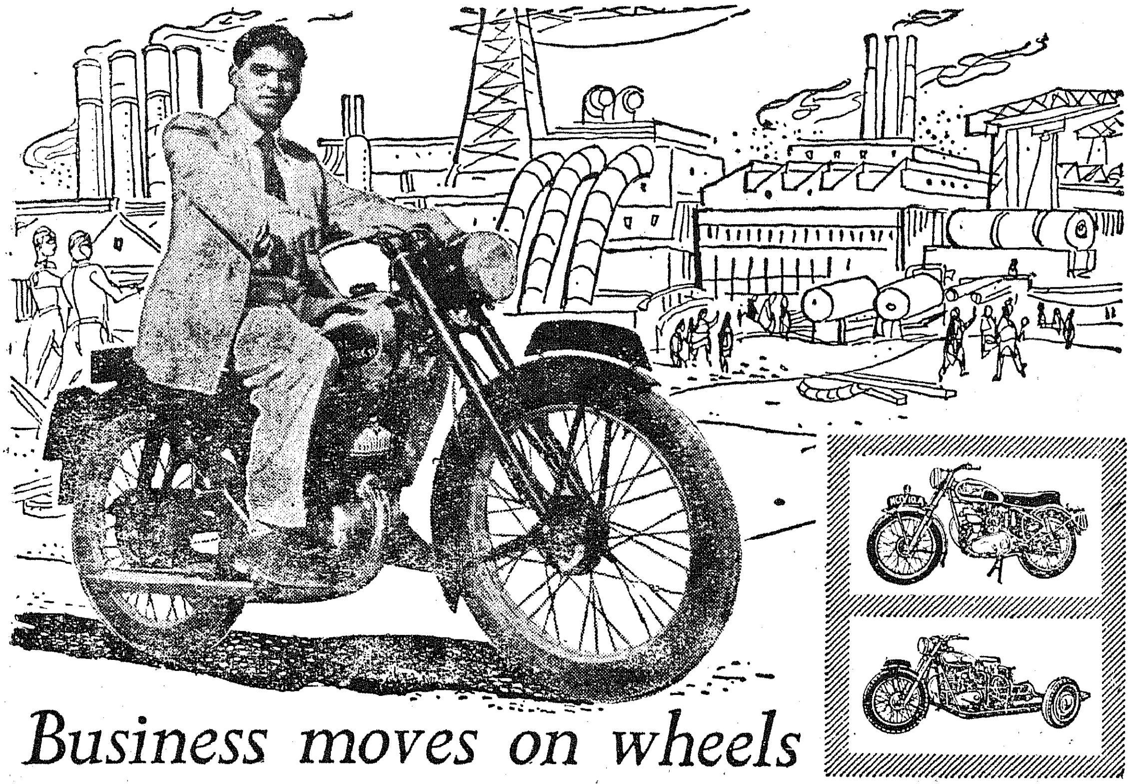
The total receipts in the manufactory branch amounted to Rs. 31,156–96 as against Rs. 18,261–32 last year. The school gardens produced 73,337 lb. vegetables costing Rs. 8,840–09 as against 55,827 lb. costing Rs. 4,868–91 last year. The receipt from the school poultry farm was Rs. 357–64 as against Rs. 310–22 last year, which was in addition to the supply of eggs to the school hospital whenever required. The receipt from the school brass band was Rs. 1,275 as against Rs. 740 last year.



Minister Manickavelu giving away a prize to one of the bright students of the Government Junior Approved School, Thanjavur.

Children lacking facilities, economic, etc., even in their most tender age, should be brought within the protective wings of the State and given the right type of education. This way, having to catch them after they become lawbreakers and put them into reform institutions can be avoided. In a welfare State, there should be more institutions caring for the under-privileged, handicapped, neglected and abandoned children.

The aim of the school has been to re-educate, reform and rehabilitate the erring, destitute, orphan, vagrant, uncontrollable children and offenders and make them lead an honest and useful life serving themselves and the country. The results so far achieved by the school have been happy.



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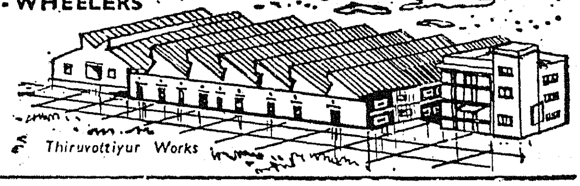


RE 129

Millets and Pulses for a Balanced Diet

L. SIVAGNANAM, K. MEENAKSHI AND M.S. THANGAM, *Agricultural College and Research Institute, Coimbatore.*

Rice is the staple food of the majority of the population in South India. Nutritional experts are of opinion that the South Indian diet is poor in nutrition values and is ill-balanced. The reasons for this will be obvious from a study of the figures of food values furnished in the following table :—

TABLE I.

Foodstuff.	Protein. PER CENT.	Mineral matter. PER CENT.	Calcium. PER CENT.	Phosphorus. PER CENT.	Iron. MGS.	Vitamin 'A' I.U. per 100 gms.	Vitamin 'B 1' I.U. per 100 gms.
Rice (raw) ..	6·9	0·5	0·01	0·11	1·0	0	20
Rice (parboiled).	6·4	0·8	0·01	0·15	2·2	0	70
Cholam ..	10·4	1·8	0·03	0·28	6·2	136	115
Cumbu ..	11·6	2·7	0·05	0·35	8·8	220	110
Ragi ..	7·1	2·2	0·33	0·27	5·4	70	140
Wheat ..	11·8	1·5	0·05	0.32	5·3	108	180
Redgram ..	22·3	3·6	0·14	0·26	8·8	220	150

(Copied from W. R. Aykroyd, M.D.)

It can be seen from the table that rice is poor in protein, mineral matter, calcium, iron and vitamins 'A' and 'B'. A well balanced diet recommended by Aykroyd, M. D., as consumption unit per adult per day, should consist of the following :—

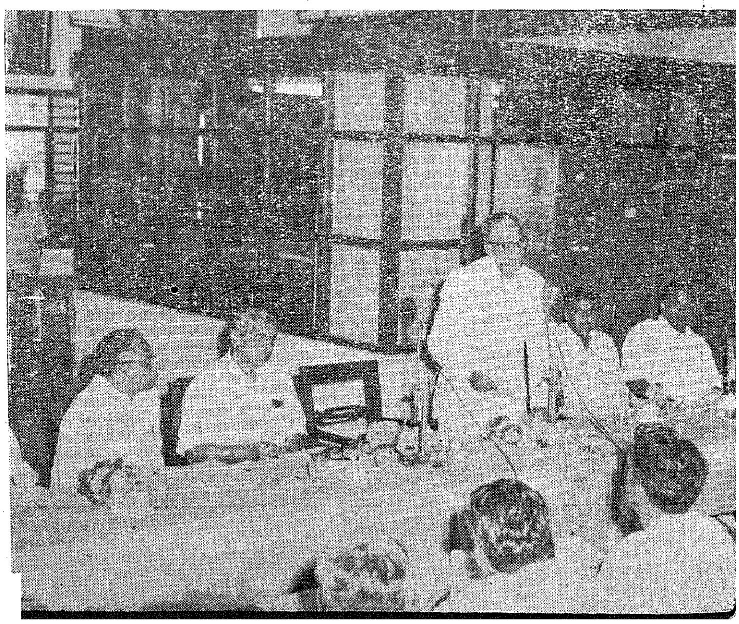
TABLE II.

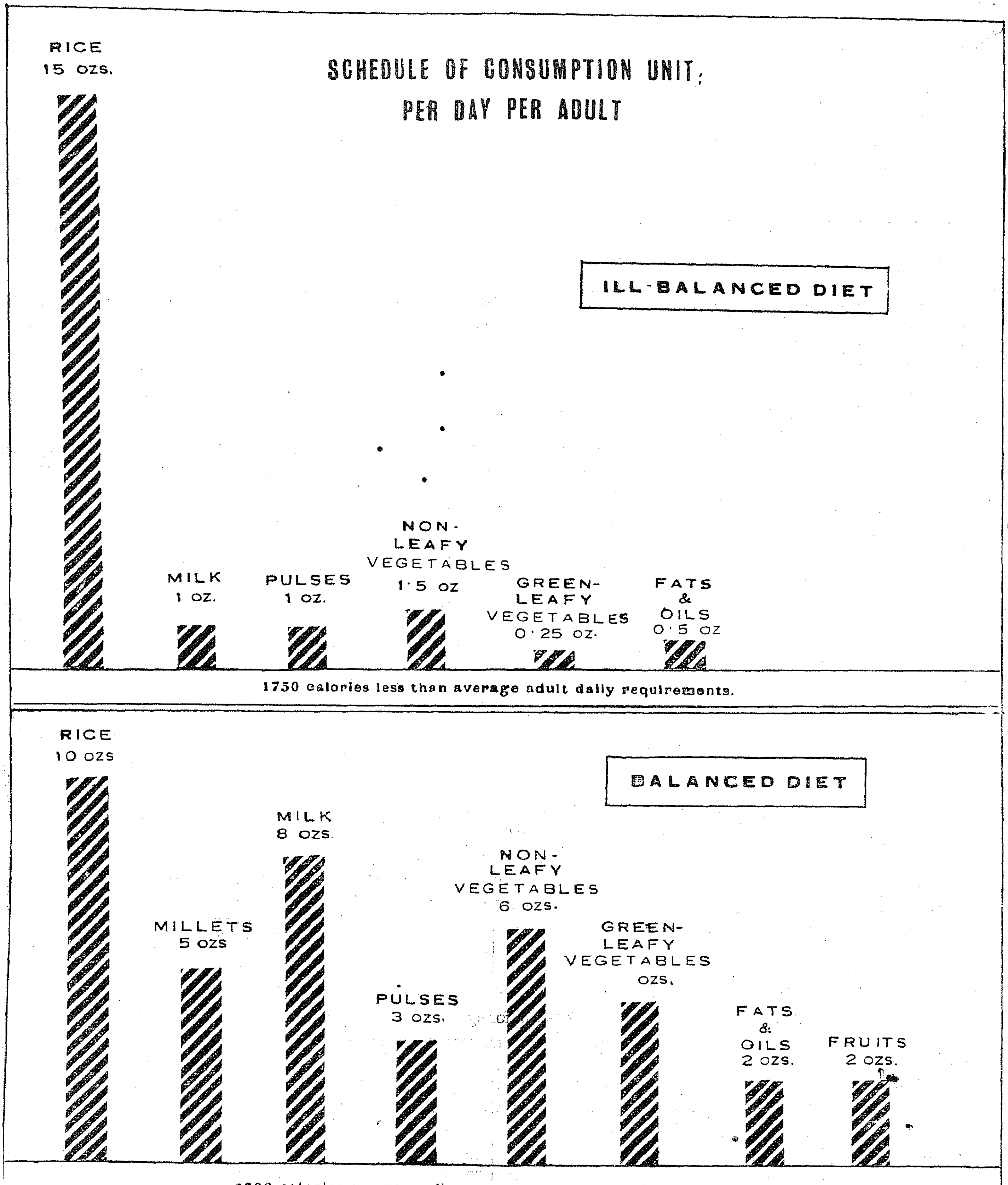
Serial number and foodstuff.	*Quantity. required in ounces.*
1 Rice	10
2 Millets	5
3 Milk	8
4 Pulses	3
5 Non-leafy vegetables	6
6 Green-leafy vegetables	4
7 Fats and oils	2
8 Fruits	2

Cheaper Foods

The best and most economic way of making good the deficiency of a rice diet is by taking to other cheaper food which will be fairly nutritious and at the same time easily available. Millets are known to be fairly rich in nutritive value. They can be secured at comparatively cheap prices. People who perform manual work find their staple food in millets, since they provide stamina for hard work. Of the millets, ragi ('Kepai') has a special appeal for both

Industries Minister Venkataraman inaugurated a Press Conference in the City recently in connection with the "Bleeding Madras" Relief Campaign. In the picture, he is seen addressing the conference.





2600 calories corresponding to average adult daily requirements.

Note: In the "well-balanced" diet Millet is included in addition to Rice.

(copied from W. R. Aykroyd, M. D.)

the poor and the well-tc-do and it is rich in calcium, phosphorus, protein and vitamins. Ragi malt is a good substitute for coffee and tea. For diabetic patients for whom rice is taboo, ragi like wheat is an important foodgrain. Babies in arms are fed with ragi gruel or ragi flour paste as it builds up healthy bones and teeth. In recent years ragi preparations like halwa, cake, biscuit, dosai, porridge, etc., have become popular. Since the predominant colour of the grain in ragi is dark brown, preparations made out of it are also brown in colour. Superior white grain ragi varieties, rich in protein and vitamins have recently been evolved at the Millet Breeding Station, Coimbatore.

Protein-rich Cholam

Cholam is also a millet high in protein, iron and vitamins. The grain of this millet can also be used for malt making. Cholam flour can be mixed with rice and blackgram in the preparation of dosai. The most popular way of making it specially edible is to convert the grain into 'pops' which are tasty to eat when mixed and taken with jaggery. This can be given even for children as it does not upset the stomach. An improved strain Co. 19, has specially been evolved for its high popping quality. Cumbu is another millet which is rich in protein, fat and iron. A mixture of rice and cumbu in 3 : 1 proportion in "iddli" preparations improves the nutritive value without changing the taste.

Pulses important

The importance of pulses in vegetarian diet needs no emphasis as they are known to everyone as the chief source of protein foods so essential for body building and repair of waste tissues. The different pulses cultivated in Madras State are redgram, blackgram, greengram, horsegram, lab-lab, cow-pea and cluster beans. The most important of these is redgram which as seen in the table has a high protein content and is used almost every day. According to the diet schedule recommended by Aykroyd, at least 3 ounces of pulses have to be included in the daily diet. Since Madras State is highly deficit in pulses, the Agricultural Department is taking all possible steps to step up the per acre yield of pulse crops. An improved strain S.A. 1 in redgram is a high yielder with good quality dhall and it suits the entire State. These improved strains have been specially evolved for high yield and quality. Seeds of the strains are being multiplied at the Millet Breeding Station, Coimbatore, and at the Regional Agricultural Research Stations to meet the growing demand for the seeds from the public.

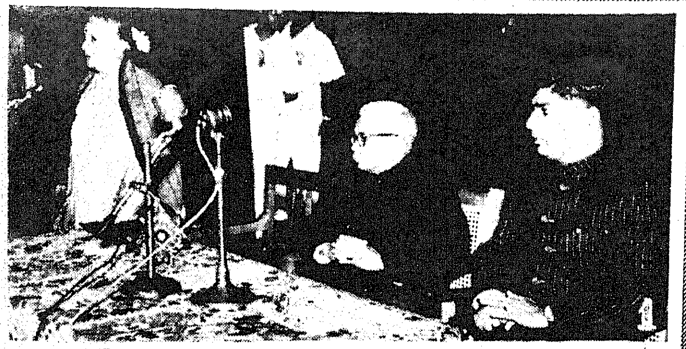
Tobacco Production in India

More than 80 per cent of the tobacco produced in India is utilized internally in the manufacture of *bidis*, cigars, cigarettes and cheroots and in the preparation of chewing, *hookah* and snuff tobacco. The production of cigarettes in the country has been increasing at a fast rate. In 1959-60, 32,000 million cigarettes were produced as compared to 18,000 million in 1952–53.

The production of tobacco brings in an income of Rs. 50 crores annually to the farmers in India. The Government earns every year Rs. 15 crores in foreign exchange by exports, and another Rs. 50 crores in the form of excise duty, agricultural cess and customs revenue.

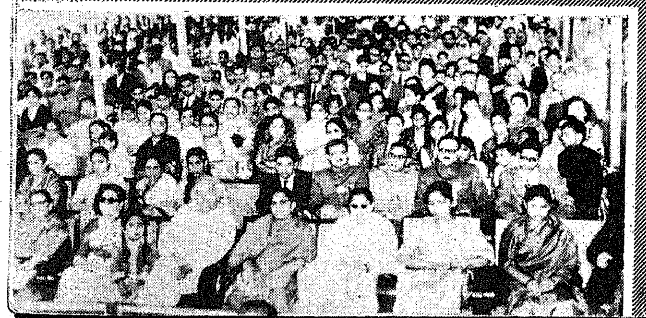
India ranks fifth among the suppliers of unmanufactured tobacco to the world market. Indian tobacco is exported to nearly 50 countries. The total exports during 1959–60 amounted to 88 million pounds valued at Rs. 14 crores.

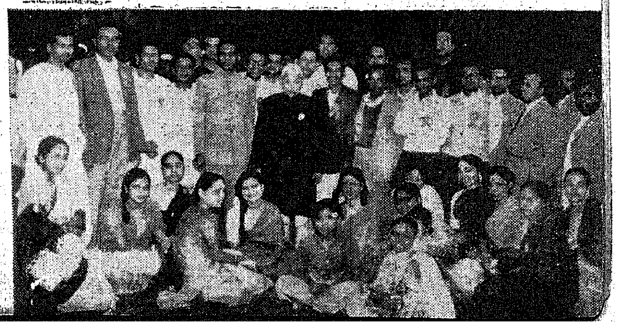
With an annual production of 700 million pounds from an average planted area of 900,000 acres, India is the third largest producer of tobacco in the world. The other two are the United States and China.



THE POLICEMAN IS AN ARTISTE TOO

The recent All-India Police Welfare and Cultural Meet at Ootacamund revealed unsuspected talents in the policeman conventionally regarded as the rigid enforcer of law alone. It revealed him as a versatile artiste too. Pictures 4, 5, 7, 10, 11, 14 give an idea of the various dance art forms that have been mastered by policemen and their families all over India. 1, 2, 3, 13, 15, 16 represent pictures taken in connection with the inaugural, prize distribution and concluding functions of the Meet. 9 and 6: A scene from dance-drama 'Lava-Kusa' enacted by policemen's children. Sivaji Ganesan with the child actors. 8 and 12: Finance Minister Subramaniam at exhibition stalls organized at the Meet. 16: Governor Bishnuram Medhi with the delegates who participated in the cultural events.





Preventing Accidents in Industrial Establishments

SRI C. V. SABNIS and DR. M. N. RAO, *All-India Institute of Hygiene and Public Health, Calcutta.*

In the whole range of industrial hygiene and industrial welfare, there is perhaps no aspect of greater importance than prevention of accidents, when India is in a transitional stage from a primarily agricultural to a predominantly industrial one. Granting that necessary finance and the other requisites are forthcoming, one of the most important factors on which the success or failure of national efforts will depend is the worker himself. Considerable attention, therefore, is being directed to the health and welfare of the worker by governmental, quasi-governmental and a few private agencies.

Amongst the various influences that tend to lower morale and cause wastage of productive time, accidents take the pride of place. They are all too common in most industries. Fortunately for the workers, only a small proportion of them result in fatalities or serious disability. This may result in complacency. But it is imperative that both the worker and the administrator realise that whether the accident is fatal or trivial, it can have far-reaching effects and should be considered from a preventive angle.

Their Causes

There is always a direct cause for accidents. A heavy load falling on a person may result in a fatal accident. A slippery floor or a naked flame at workplace, for example nearly always lead to an accident. These direct causes may be obvious but the origin and causation need study. If one were to analyse the so-called direct causes there is always a human factor, though occasionally the human factor is to a large extent influenced by environmental factors.

There are important physiological aspects that contribute to the incidence of accidents. For example, women are known to have less accidents than men doing comparable jobs. In a study from the Physiological and Industrial Hygiene section of the India Institute of Hygiene and Public Health, Calcutta, the ratio was 5 : 24 reportable accidents in 1946 in Bengal. Younger and more inexperienced workers are also known to be involved in more accidents than the adult and more experienced groups. The very old again are more prone to accidents.

Again accidents are minimum at the beginning of the day or shift and, as fatigue gradually sets in, the number of accidents increases two-fold or more at the end of the day or shift. Similar increase in the accident frequency usually follows whenever the daily or weekly working hours are increased.

Mental Factors

There are many mental factors that might involve a person in accidents. Inattentiveness, carelessness in a given situation, foolhardiness due to overconfidence, slow cerebration are typical mental traits that may increase accident liability. Ignorance and lack of education of the hazards of occupation also contribute to increased exposure to risks of accidents.

Inexperience is also frequently a cause of accidents. Unaccustomed to the general factory conditions where people and objects move quicker than is usual outside, new workers are specially liable to accidents. The other type of inexperience is when the worker is transferred from one job to another and has not become skilled at it. Such workers though familiar with the general dangers of factory life may not have acquired the necessary mental and muscular habits to do their new work without faulty movements.

Inherent Traits

Even if all these conditions are satisfied, and the worker is mentally aware of the hazardous nature of the job, some have inherent traits which make them more liable for accidents than others. This is a common experience either in the home or in the factory. Some people just have a knack of breaking crockery at home or injuring themselves in factory accidents. This is an interesting field for an industrial psychologist.

Amongst the environmental factors that are known definitely to influence the incidence of accidents may be mentioned environmental temperature and lighting. It is a common experience in Indian industry that the accident rate is higher in summer than in winter. Similarly it is the experience in cold countries that more accidents occur while working at low environmental temperatures. An

interesting study by the Medical Research Council of Great Britain (Bedford) has shown how in coal mines the accident rate was high at extremes of environmental temperatures and also that the very young and the very old were affected most.

Poor Illumination

Poor illumination leads to low visual acuity and this, in turn, is known to reduce human efficency as proved by many studies on precision jobs. Not only are accidents known to be inversely proportional to efficiency beyond a marginal limit but greater liability to accidents may be scientifically ascribed to poor perception. Based on such experiences are the physiological standards of illumination recommended for adoption for specific occupations or situations.

An illumination survey from the All-India Institute of Hygiene and Public Health in twelve factories has shown inadequate illumination below the recommended standards in 65 per cent of the test points even during the day.

Accidents always involve losses. Some of the losses are direct and apparent, others inherent and latent. The full cost of an accident is difficult to compute. The loss may involve the worker himself, the industry concerned and also indirectly the nation. The loss to the worker is the human suffering and the difference between the earning ability and the nominal compensation costs awarded for the disability. The industry loses by way of medical care and the compensation costs, lowered morale and lowered production, expenses on the train-machinery and goods, etc. Finally, the nation also loses by way of lost production through time-loss as well as lowered production through lowered productivity.

Trends in Factories

American statistics which take many of these factors into consideration estimate that nearly 10 million accidents in 1956 cost the nation some 10·8 billion, some 1,000 dollers per accident. The cost of industrial accidents alone is estimated by the National Safety Council of U.S.A. at 3·6 billion.

The paucity of comprehensive data-nay even basic data-makes the task of computing similar losses through accidents in India very difficult. But the excellent attempt by the Labour Bureau of Statistics does reveal certain important trends in industrial sickness and industrial accidents.

The trend of accident-rate in factories is significantly on the increase since independence; from a frequency rate of accidents of about 25·8 in the year 1947 to 43·2 in the year 1955. Though not so marked as in factories, the trend seems to be in the same direction in the mines also. In 1947 the annual severity rate of accidents in mines was 3·6 compared to a severity rate of 7·4 in 1955.

This trend or increased accidents is obvious not only in different States but also in different types of industries. Such an adverse trend of accidents in our industries can possibly be explained only by a combination of factors that may have their origin in the events since independence. These factors may be considered in relation to their source or responsibility as arising from (1) the worker, (2) the industrial management or (3) the State.

Recruitment Standards

The rapid industrialization of the country and the consequent high demand for industrial labour has led to lowering of recruitment standards. Recruited perhaps without recognized practices of recruitment, such as pre-employment examination, aptitude test or job analysis and introduced to industrial work without any job training programme, the worker, new to an environment, where both machines and men move faster, is a ready prey to casualities till he acquires the necessary training or safety consciousness at a personal price.

For some reason or other, the attitude of the average Indian industrialists towards the whole question of workers' health and safety seems to be growing apathetic over the last decade. Such an inference seems only logical when we consider that the total number of prosecutions for violations of the Factories Act, which is intended to improve the conditions affecting the workers seems to be continuously on the increase, the number of such prosecutions being 2,743 in 1951 as against 5,620 in 1955. During these years, there was not much change in the number of inspections (28,437 in 1951 and 28,119 in 1955) to explain such an increase in prosecutions.

Finance Minister Subramaniam, opened the Sales Depot of the City Khadi Development Co-operative Society at Ayanavaram recently. In the picture, the Minister is seen inspecting Khadi fabrics at the depot.

What the underlying causes of such a changed situation may be needs a serious study. It is felt, however, that some of the recent legislations may have an indirect, though perhaps a temporary bearing on the subject.

As at present, except a few enlightened managements, the majority perhaps are unaware of the indirect relation between the health or safety of the worker and his efficiency or productivity with its bearing on the industrialists' own profit. The obligation of the expenditure on the health or safety of the worker by an average Indian industrialist has therefore always been a grudging acceptance, sometimes due to charitable outlook, but more often due to compensation costs which are his direct responsibility. The lifting of such a direct financial pressure on the industrialist could be expected to result in an increase of the prosecutions for violation of the health and safety provisions, for example, of the Factories Act. This is borne out in practice by an actual increase of such prosecutions from 263 in 1951 to 960 in 1955.

Direct financial interest

The direct and visible financial interest in trying to minimise the sickness or accident disability in industry was perhaps, to a certain extent, affected by the Employees' State Insurance Act taking over the workman's compensatio . The progressive implementation of the Act increasingly absolves the employer of his financial interest in the matter, perhaps the only interest which he could understand. Having paid his fixed levy to the Employees' State Insurance Corporation, he is inclined to consider the question of workers' safety as no more a concern of his and would naturally be unwilling to spend anything more either on health maintenance or safety. These reflections on the working of an average Indian industrialist's mind are borne out when we realise the changing picture of factory safety or medical care programmes. Hitherto, wherever such a programme existed, a full-fledged factory medical department in close contact with the worker and his working environment, could act as a watch and ward over the health or safety of the worker. The Employees' State Insurance Act has now made its position unjustifiable in the eyes of the industrialist and despite recommendations of the Government to the contrary, the medical departments in industries are on the decline.

The problem in mines

The causes in the case of mines may be different. The large majority of mines are in the hands of private owners. The ever-increasing possibility of the State taking over or nationalising essential mines like gold, manganese and coal, which employ more than three-quarters of the total mining labour in India might have a damping effect on the interests of the employer in the current safety problems and future health programme.

In the matter of both safety or health maintenance perhaps the most important step to be taken is inspection both at Governmental level as well as from within the industry, and the inspection services dovetailed into educational programmes. It is only by frequent inspections that conditions in industry jeopardizing the safety or health of the worker can be progressively eliminated. At present, barring a few exceptions, such programmes within industries in India are practically non-existent. At the State level, enforcement of specific legislation in various States continues to be inadequate. For example only some 85 per cent of the factories in India could be inspected in any one year during the decade since Independence. Not only are the number of inspectors inadequate, but perhaps their training for the specific jobs can be supplemented in the light of modern advances.

State Responsibility

Under the existing legislative procedure, the inspection of factories and mines is a State responsibility. It is incumbent on the management to report to the factory inspectorates, accidents either fatal or those causing disability for 48 hours or more. One of the drawbacks of the existing provision from the point of view of those interested in the worker's safety is that the management's obligation is restricted to maintaining a record of only such accidents as are called Reportable Accidents. Thus, in a large majority of instances, no records are available in Indian industry of accidents not resulting in injury to the worker, disabling him thereby for periods less than 48 hours.

But from the preventive angle, all accidents are of equal importance, whether reportable or not. In both

The Finance Minister inaugurated the National Exhibition of Art at the Centenary Hall, Egmore, recently. In the picture, he is seen inspecting a section of the exhibits.

the instances, the causes are the same, reportability or otherwise depending entirely on the chance factor.

Non-reportable accidents

For every one fatal accident in factories during 1955, there were accidents causing disability of 48 hours or more amounting to a total of 116,010. One can, on the U.S. experience, expect therefore that the number of accidents which resulted in minor injury and hence were non-reportable could not have been less than 3,364,290, while the number of such events in which fortunately no injury occurred was 11, 610,000. It has to be remembered, however, that every one of these is potentially capable of causing a lost time or disabling injury, though by chance the accident did not result in such an injury.

This brings home the importance of all accidents, trivial or minor, major or fatal, to be equally assessed in formulating a control programme.

Machine Vs. Human Factor

The cardinal fact to appreciate in planning accident prevention is that most of the accidents are man-made. Though accidents are erroneously attributed to machines, experience shows that barely 15–20 per cent of all the accidents are those where machines are concerned. Even in these cases, the accidents occurred though the machines were provided with protective guards.

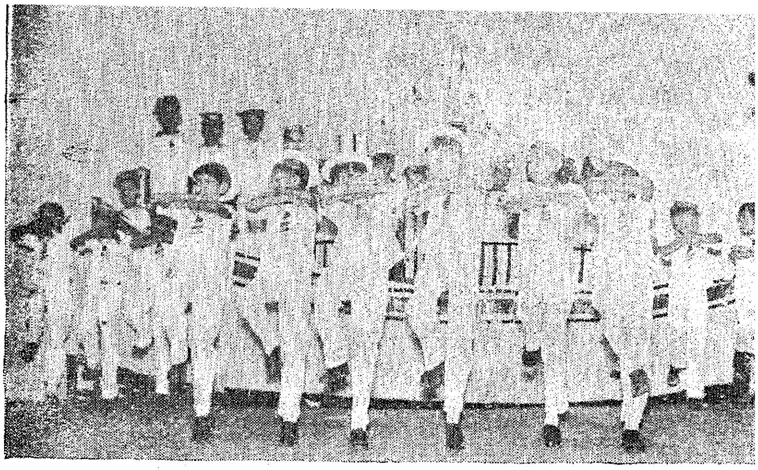
To be able to prevent accidents successfully, one must understand why and how accidents occur. Most of the accidents, where men are injured, are the logical termination of a series of factors which follow one another in a chain reaction. These may be summarised briefly as—

(1) *Nature and nurture* : Temperamental defects and aberrations may be inherent in the worker as hereditary characteristics or may be temporarily acquired as a result of poor social environment. These may constitute the immediate reason for the ensuing unsafe act or for the existence of a hazardous condition in the environment.

(2) *The unsafe act* : The commission of an unsafe act by the person in an environment created by himself, co-workers or the management.

(3) *Accident* : The resultant of factors 1 and 2; an unsafe act in a temporarily susceptible person or due to unsafe environment resulting in an unexpected occurrence.

(4) *Injury* : The extent of the resulting injury ranging from nil to fatal—the extent depending largely on the chance factor.



An interesting scene from "Ship Ahoy" staged recently by the students of the St. Bede's High School, Madras, in connection with Parents' Day celebrations.

Since injury is thus the logical end of a chain of events, the essence of accident prevention is the interruption of this chain by elimination of any one of the factors that comprise it.

Unsafe Acts

The most important factor which can possibly be controlled is the unsafe act or the causes which may lead to the indulgence in such unsafe acts. The reasons for commission of such unsafe acts can be placed broadly under four groups, the unsuitability of the person, ignorance or improper attitude of the worker and specific factors in the environment.

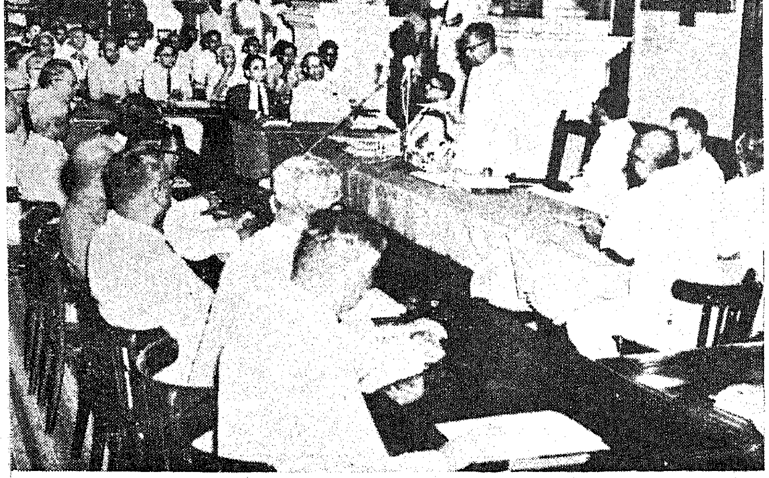
Unsuitability may be psychological or physical. Almost 80 per cent of the industrial accidents are found to be committed by the same 15—20 per cent of the total workers. Careful weeding out of such accident repeaters or accident prone persons specially from dangerous occupations is very likely to result in elimination of many unsafe acts in industry and will be reflected in a significant reduction of accidents.

Again persons with defective vision working at machines or night shift duties, colour-blind engine-drivers, women workers on jobs beyond their physical capacity and such other cases obviously contribute to a fair percentage of industrial accidents and may need removal from such positions to safer jobs.

Pre-employment examination

Elimination of these factors naturally requires adequate pre-employment examination facilities. At present such facilities do not exist as a rule in India.

Where the worker has not been properly trained or initiated into the job, his very ignorance of the danger may result in the commission of an unsafe act. Adequate job-training, especially in safety practices may therefore be recommended.



The Minister for Industries and Co-operation, Sri Venkataraman, is seen addressing the Conference of Deputy Registrars of Co-operative Societies which he inaugurated at Rajaji Hall recently.

Even experienced workers are often found to be involved in accidents not because they are ignorant about safety practices, but will not practise them because of their spirit of bravado or over-confidence. Eye injuries despite provision of safety goggles and machine accidents due to removal of safety guards provided or serious accidents while lubricating moving machine parts are testimony to such an attitude on the part of woker towards his job.

Constant education programmes and adequate disciplinary measures can help in rectifying this attitude.

Specific Industries

Specific industries have specific environmental factors directly influencing the commission of unsafe acts and resulting in accidents. Periodic inspections of such factors with a view to their rectification and administrative machinery for constant intra-mural checking would always bring about a progressive improvement in the incidence of accidents.

For effective execution, safety work in industry must be an integrated programme, based on accurate knowledge through intensive investigation and effort. The investigation should bring out accurately the unsafe causes and efforts should be directed to the control of unsafe personal performances or unsafe conditions.

In an effective organization, a good safety department under a capable safety engineer is the first requisite. The second important step in organization is to secure the co-operation and interest of the various parties concerned, through representative safety committees. More than the details of administrative relationship, the active and susained interest of the workers themselves and the management is of great importance.

Record maintenance and analysis

A skeleton organization comprising the safety engineer and the safety committee can plan up a safety campaign only through scientific accident surveys. To survey the why and wherefore of accident occurrence, adequate machinery for maintenance of records is essential. There must therefore be a systematic maintenance with all possible details, not only of reportable accidents but also of all accidental occurrences potentially capable of causing injuries. The common fault in Indian industry today is to base safety programmes on analysis of accidents recorded with a view to submitting the returns to the State Inspectorate of Factories. These recorded cases represent mostly those in which actual injury has occurred. The temporary chance factors which caused the injury are thus unduly emphasized instead of the real causes which bring about such accidents. This, therefore, results in an ultimate failure of the safety campaign due to wrong remedial measures being adopted instead of the correct ones.

Remedial measures

Finally, there should be adequate provision for quick and periodic analysis of the accident records. Mechanical tabulating systems, though initially expensive, are a great advantage in good record maintenance and analysis.

Once the analysis of facts of accident causation indicates the trends, the next step is to adopt the necessary measures to prevent recurrence of such accidents. The remedial action in accident prevention work may be grouped into two categories, (*a*) the engineering programme and (*b*) the educational programme.

The primary cause and the contributing causes in the environment should be removed as far as possible. Unsafe tools and machines should be guarded, replaced revised or made mechanically safe. A programme for the environmental control of factors like high temperatures, excess noise and poor illumination should be initiated and carried out.

Educational Programme

A well-planned and continuous health education programme in safety is essential. All the known health educational methods of communication may have to be resorted to, to make the worker safety-conscious. Medical and psychological procedures may have to be strengthened to help the physically and psychologically unsuited. Judicious use of safety competitions and incentives in various forms may be tried.

Above all, as in all scientifically planned health educational programmes, an authority of choice, voluntarily preferred by the workers themselves should be made use of more than the authority of consequences leading to disciplinary enforcement.

An analysis of the available published data shows that both the total number of accidents and the loss of time and production involved are on a steady increase. The possible influence of different factors, such as the changing attitude of the employer towards the worker's health and safety, the indirect influence of rapid industrialization, recent legislative policies and the present inadequacy of inspection systems have been discussed. Modern principles of accident prevention have been presented to show that the older view that accidents are unpredictable and hence inevitable is no longer tenable. It has been shown that by a scientifically planned and well-organized effort on a national scale, a large majority of accidents are preventable.

Need of the hour

Such an effort is the crying need of the hour in the national interest. It must be a joint effort by the Government and the employer, the two important forces, along with support from organized labour. At present, the Employees' State Insurance Corporation has confined itself primarily to the medical care and the compensation liability for the worker. The employer may therefore be tempted to shelve his responsibility for the reasons cited earlier. The field of industrial health maintenance or preventive medicine of which accident prevention is but an aspect has thus fallen in the doldrum after the post-war fillip. Perhaps the situation might possibly improve when the Employees' State Insurance Corporation in no distant future undertakes the responsibility also for the preventive aspects of the worker's health, instead of confining itself to curative aspects only as at present.

Willing Participation

In the meantime, measures must be taken to shake off the employer from any apathetic and disinterested attitude towards the health and safety of the worker. May be, revision of the employer's contribution based on periodic appraisal of the health and accident reports and control programmes within the industry could bring about a healthy change in the attitude of the employer. A simultaneous drive to educate the employer into the economics of health maintenance and safety of the worker through suitable means may also gradually convert him into a self-convinced and willing participant. This the pressure of the State cannot achieve.

Finally, one must not forget the axiom that nothing can be achieved without the willing participation of the workers.

Production of malted milk powder

An improved process for the production of nutritive and palatable malted milk powder and allied products has been developed at the Central Food Technological Research Institute in Mysore.

The new process makes use of solid powder, such as malt extract and milk powder, as base material instead of fresh milk and malt liquor. Production is thus facilitated since the amount of water to be evaporated for preparing the product is reduced.

The base materials required in the new process are ragi, jawar, barley, wheat and milk which are easily available in the country.

The total capital outlay for a 300-ton annual capacity plant is estimated at about Rs. 6·85 lakhs.

In recent years a considerable market has been developed for malt products in India. The demand has been largely met from imports. In 1957 the total value of malted milk and malted milk powder imported was about Rs. 95 lakhs. Since then, imports have been drastically reduced to about 5 to 10 per cent.

What's New in Science

[Everyday that passes in this age of Science registers some important advance or other as a result of which new and improved techniques emerge to lighten the burden of the housewife, the common artisan, the small businessman and the big industrialist. This feature aims to take note of such developments. This article contains notes on the Improved Pasteurizer, Malted Milk Powder, Emulsions and Resins from cashewnut shell liquid, Dispersion Resins, Prototype Hearing Aids, Dyeing of Wool, Silk and Nylon with Lac Dye, Moisture-proof linings for bagging urea and on Benzyle chloride.

An improved pasteurizer has been evolved at the Central Food Technological Research Institute, Mysore. The pasteurizer, which has been patented, is stated to be an improvement over the equipment available in some of the industrially advanced countries.

The colour, flavour, texture and vitamin content of many canned foods are most effectively preserved by high-temperature, short-time cooking or pasteurization. Commercially, this is accomplished through flash-pasteurization and agitation. Flash-pasteurizers are, however, suitable only for liquid food products like fruit juices and have not been successful in processing semi-fluid or viscous food products like fruit juice concentrates, pulps, pastes, soups, etc., and of canned fruits on account of their high viscosity.

The Mysore Food Technological Research Institute has developed a batch-type agitating cooker in which hermetically sealed cans containing acid foods (fruits) rotate axially in steam at atmosphere pressure for some time (depending upon the nature of the product) enabling spin-cooking of the cans under water sprays within the cooker.

Salient Features

A variable speed drive giving wider range of axial rotation of cans thereby providing facilities for the processing of a greater range of canned acid foods of different viscosities is one of the important features of the design. The processing time of various fruit products ranges from 1 to 3 minutes only as compared to the 20 to 30 minutes required with the conventional stationary processing. Heat-sensitive fruit products can be destroyed without affecting the product. The cost is only about a fourth of similar imported equipment.

About 500 cans per day have been spin-processed over the last two years in a prototype spin pasteurizer. Products which have been spin-processed in this unit include canned fruits such as mango slices, pineapple, orange segments, banana chunks, papaya chunks and tomatoes; fruit pulps like mangola, mandarin orange juice, pineapple juice, tomato juice and mango pulp; fruit juice concentrates of mandarin orange, mosambi orange and pineapple and tomato soup. All these have stood storage tests for 6 to 12 months at 30° C.

Malted Milk Powder

A new process for producing malted milk powder has been developed at the Mysore Food Technological Institute. The process consists in mixing concentrated malt extract with milk powder, fats and carbohydrates followed by vacuum drying.

A notable advantage of the process is the use of milk powder in place of liquid milk and concentrated malt extract in place of mash liquor prepared from green or kilned malt, which eliminates the need for evaporation.

Fifty pound batches of the milk products have been successfully prepared and found to compare favourably with imported products, both in taste and flavour. The shelf life of the product is about one year at 37° C. Raw materials required for the process, namely, milk, ragi, jawar, barley and wheat are all available indigenously.

Total capital outlay on the plant having a capacity of 300 tons per annum is estimated at about Rs. 6·05 lakhs, and the equipment required includes vacuum shelf driers, powder filling unit, mixers, seamers and granulator.

New Emulsions, Resins

A new process has been worked out for making stable emulsions from cashewnut shell liquid, aldehyde condensate resins, their solutions and polymerized cashewnut shell liquid.

The emulsions obtained are rapid-drying and free from odour and fire hazard. They can be applied on wet as well as porous surfaces and the films obtained can withstand washing. These emulsions are suitable media for primers

and possess tolerance to addition or corrosion inhibitors. Sealing pastes based on these emulsions can stand hot reveting.

Another process which has been patented makes available isogel-stage cashewnut shell liquid resins either by condensing raw cashewnut shell liquid with aldehydes followed by heat processing at low temperatures or by condensing the heat-polymerized cashewnut shell liquid with aldehydes at room temperature under alkaline conditions. The resins so obtained are mechanically dispersed in suitable solvents.

These dispersion resins give fast drying finishes which adhere to metals and which can be recoated with lacquers without lifting. They can be used for making rich paints and primers which, when applied on steel surfaces, give cathodic protection.

Both the processes have been studied out in the laboratory and 2-2·5 gal. batches of the products have been prepared. Service trials of emulsions were carried out in connection with water-proofing of brick walls and reinforced concrete structures. Observations after two years on brick walls, six months on concrete structures and on wagons have shown that their performance is satisfactory.

Products based on the dispersion resins also have been tried on coaches, wagons, bridges and tracks. These were pointed at different times during the past two years and have been found satisfactory so far.

Cashewnut shell liquid, the main raw material for both types of products is available in the country. Other raw materials like bentonite and tannins are also indigenously available. The cost of equipment required is estimated at Rs. 25,000.

Prototype Hearing Aids

Interesting details are available of the designs of cheap and efficient hearing aids developed at the National Physical Laboratory. The research work was undertaken at the instance of the Ministry of Education which asked the National Physical Laboratory to investigate the possibilities of manufacturing hearing aids which would be sufficiently cheap to be within the reach of the institutions for the deaf and dumb in the country.

Of the two personal hearing aids designed, one employs miniature valves and the other transistors. In these hearing aids, minimum number of imported components have been used and both the initial and maintenance costs of the units are lower than those of imported units.

A portrait of the eminent Tamil Scholar Dr. R. P. Sethu Pillai was recently unveiled at the Senate House by Vice-Chancellor Lakshmanaswami Mudaliar.

Based on laboratory estimates, the cost of the personal hearing aid using the transistors works out to Rs. 175 and that of the group hearing aid to Rs. 1,800. The group hearing aid designed consists of a unit to mix the output for several microphone channels followed by a properly shielded amplifier which has two outlets and six channels, each, thus providing listening facilities for 12 deaf students. Steps have been taken by the National Physical Laboratory to pass on the new invention to the industry for commercial manufacture.

Purified Lac Dye

Conditions for dyeing protein and polyamide fibres like wool, silk and nylon with purified lac dye have been standardized as a result of investigations undertaken in the Department of Chemical Technology, University of Bombay.

The Minister for Revenue and Health Sri Manickavelu giving away a merit certificate during the Anniversary celebrations of the City Youths Union, Choolai, over which he presided.

Dyeings of specific shades and fastness properties have been produced by employing suitable mordants. Procedures have been evolved for obtaining crimson, purple, orange, red and brown dyeings.

Although lac dye has been used in India for dyeing silk and wool, systematic studies with respect to the range of shades obtained and fastness characteristics have not been carried out so far.

Polythene Linings

Search for moisture-proof packaging of hygroscopic fertilizers at Sindri has indicated that polythene liner stitched to jute bag gives maximum protection against humidity. For protection of urea against caking, the thickness of the liner should be at least 0·002 inch.

Among the different linings tested at the Sindri's Technological Department for moisture impermeability and ability to withstand rough handling were: polythene liners, crepe paper pasted with bitumen to jute, two plies of bagging paper laminated and pasted with bitumen to jute and paper laminated and pasted with bitumen to jute and polyvinylidene chloride-coated jute bags.

The results showed that polythyene-line jute bags are superior to polyvinylidene cholride-coated or paper-lined jute bags. Polythene liners stitched to the jute bag are better than loosely inserted ones. The liner, larger in dimension, and the jute should be folded and doubly stitched so that there is less likelihood of moisture penetration.

Benzyl Chloride

A new process for the manufacture of benzyle chloride developed at the Regional Research Laboratory, Hyderabad, eliminates the drawbacks of decomposition and polymerization encountered in the conventional process of chlorinating toulene. High yields of pure benzyl chloride (90 per cent of the theoretical) have been obtained.

As indigenous production of benzyl chloride is meagre, it is at present imported. In addition, some chemicals, derived from benzyl chloride, namely, phenylacetic acid benzyl acetate, benzyl benzoate and benzyle alcohol valued at over Rs. 10 lakhs were imported during 1959.

The process has been studied in a pilot plant (15 kg. capacity) and technical and economic data for designing a commercial unit have been collected. The raw materials toulene and chlorine are readily available.

Central Coal Workshop in Bihar

National Coal Development Corporation's Central Workshop at Barkakana in Bihar was formally opened on April 30 by the Governor, Dr. Zakir Hussain. The workshop which has been built at a cost of Rs. 1·5 crores, will employ about a thousand workers and will carry out major repairs to heavy machinery and manufacture spare parts.

In Ranchi, on April 30, eighty-seven workers from different collieries under the National Coal Development Corporation were awarded certificates of merit at a special function organized to celebrate the fulfilment of the Second Plan target by the Corporation. Dr. Zakir Hussain, Governor of Bihar, gave away the certificates.

Certificates of courage and devotion to duty in recovery operations in the deep pit were also awarded to six workers from Giridih colliery.

Bringing Ayurveda in line with Modern Practice

Considerable work has been done in recent years for the development of Ayurveda, the ancient Indian system of medicine, and to bring its study and application in line with modern knowledge and requirements.

Dating back well before the beginning of the Christian era, Ayurveda (literally, the knowledge or science of life) was among the first systems of medicine in the world to be developed and practised on scientific lines.

Treatises on medicine, anatomy, gynaecology and children's diseases, as well as other aspects and branches of the medical science, are part of the lore of Ayurveda. Its influence had spread well beyond the shores of India and among its special feature was the study of dietetics.

Western Influence

With the passage of time and the advent of Western influence, the study and practice of Ayurveda became stagnant. The system, however, continued and to a considerable extent, still continues to be the only treatment known to large numbers of people, particularly in the rural areas.

In 1920, the Indian National Congress adopted a resolution urging the people to make an earnest effort towards the application of scientific methods for the investigation of the system of indigenous medicine.

Since Independence, encouragement of the Ayurvedic (as well as the Unani) system of medicine has been recognized as part of State Policy.

Proper Training

The effort has been to bring it in harmony with modern knowledge, introduce uniformity into the system of education in Ayurveda, provide the students of Ayurveda with a minimum basic knowledge of modern practices and the scientific system of investigation and to incorporate useful and valuable elements of Ayurveda in the general medical practice for the benefit of humanity. Particular emphasis has, therefore, been laid on research and proper training facilities.

With these guiding principles in view, a number of teaching institutions have been set up and several States have introduced combined courses so that students who are trained in Ayurveda are also provided a minimum basic knowledge of the modern system.

During the First Plan a provision of nearly Rs. 37 lakhs had been made for research and development of the indigenous system of medicine. In the Second Plan, this provision has been increased to Rs. 6 crores.

Research Council

The Central Government have set up a Central Council of Ayurvedic Research to advise them on the co-ordinated development and practice of Ayurveda and the promotion of research.

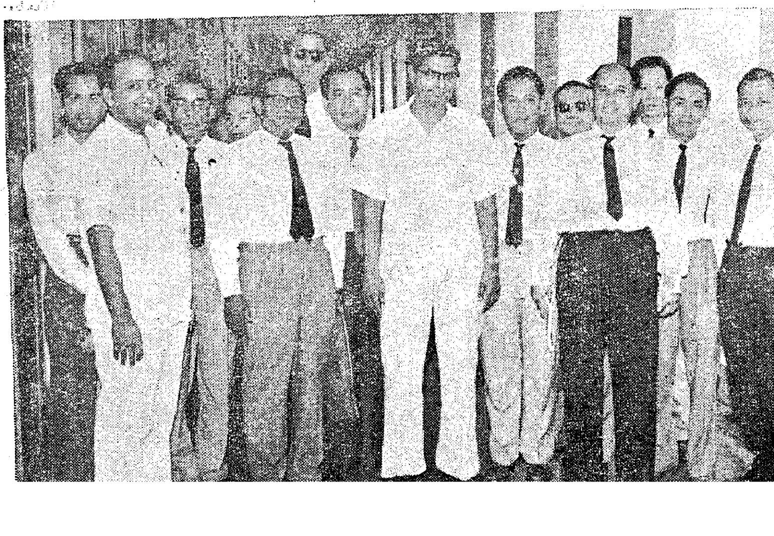
At Jamnagar, in Gujarat, research has been carried on for the last eight years at the Central Institute of Research in Indigenous System of Medicine set up by the Central Government. The Institute has taken up a number of diseases for investigation, apart from research on drugs, plants and herbs.

Attached to the Institute are a hospital, an out-patient department, a laboratory and a pharmacy. Apart from Ayurvedic physicians (including practitioners of the Siddha system of South India), practitioners of modern system are also attached to the Institute for purposes of comparative study. The Institute not only carries on research but provides facilities for training in methods of research.

Post-Graduate Course

A Post-Graduate Training Centre in Ayurveda has also been set up at Jamnagar where 25 students selected on an All-India basis are admitted every year for higher training. The students, after completing the course lasting two years,

A party of Malayan rural leaders who were on a study tour of South India photographed at the Secretariat with officials of the Rural Development and Local Administration Department. The Malayan team had discussions on Panchayat development in the State.



Governor Bishnuram Medhi presented the Madras State Sangeet Natak Sangham Awards for distinguished contribution to the stage and screen to veteran artistes at a special function in the City recently. In the picture, he is seen giving away the award to stage actress M. S. Drowpathi.

become teachers or research workers at Ayurveda institutions in different States. This Centre also has a hospital for clinical studies.

Financial assistance has been given to other institutions for research in Ayurveda and for the upgrading of training institutions.

Pharmacopoeia

Yet another step towards the harmonisation of Ayurveda with modern medicine will be taken soon with the introduction of Ayurveda as an optional subject of study in six medical colleges.

The compilation of a pharmacopoeia of Ayurvedic drugs has been taken in hand by a Committee appointed by the Central Government. It is also proposed to standardise these drugs.

The Central Council of Ayurvedic Research has recently recommended that a Central herbarium and regional herbaria be set up for study and identification of Ayurvedic herbs.

Leprosy Control

It is estimated that there are over two million leprosy patients in India, the incidence in some places being as high as 40 per thousand. About half a million of these are of the infectious type.

Until about 15 years ago Leprosy work was almost one ot mercy and love to which dedicated people devoted themselves. Mahatma Gandhi, who himself nursed a leper in Sevagram, gave a lead in voluntary work for the betterment of the conditions of victims of this disease. Now, it is increasingly being recognized as a medical and scientific problem as well, to be tackled by medical and other research workers. The discovery of Diamino Diphenyl Sulphone (D.D.S.) has ushered in a new era in the treatment of leprosy.

Voluntary organization like the Mission to Lepers and the Hind Kusht Nivaran Sangh have been mainly responsible for the anti-leprosy work on a voluntary basis.

The problem has also been engaging increasing attention of the Union Government. The Government appointed a committee in 1954 to review the extent of leprosy in the country. The areas of high prevalence are mostly found in the eastern parts of the country (five or more per thousand) though there are some points of incidence in the central and southern parts. In these areas, there are whole districts with rates as high as 20 to 40 per thousand and in some individual villages or groups of villages even as high as a hundred per thousand.

National programme

The Government have launched a National Leprosy Control programme to give modern treatment to persons suffering from leprosy in selected areas. Each centre covers a population of 50,000 or more. Early cases are detected and mass treatment with sulphone carried out besides educating the public.

So far 113 centres have been established, covering a total population of about 13 million. A training centre has been set up at the Medical College Hospital, Nagpur, for giving reorientation course to the doctors who are required to man the leprosy control centres.

A Central Leprosy Teaching and Research Institute is functioning near Madras for training leprosy workers and for conducting research on problems relating to leprosy.

Advisory Committee

In collaboration with the Gandhi Memorial Leprosy Foundation, Government have also started a training centre at Chilkapalli in Andhra Pradesh for training doctors.

In 1958 the Government of India constituted a Leprosy Advisory Committee consisting of representatives of Government and leading voluntary organizations working in the field of leprosy to review the working of the various leprosy control schemes, to consider requests for grants for leprosy work and to make recommendations to Government.

An attempt has also been made to study the response of contacts to prophylactic treatment with D.D.S. The results of the study have been encouraging.

More Training Units

During the Third Plan period, Government propose to have more extensive coverage. Besides establishment of control units, ten more training units will be established for imparting training to medical and para-medical workers. In addition, rehabilitation centres are also contemplated to look after the physical, psychological and social rehabilitation of leprosy patients.

It is also proposed to establish an all-India training centre for reconstructive surgery and physiotherapy.

For the Plan period an allocation of Rs. 7 crores has been made for anti-leprosy work. International agencies like WHO and UNESCO have also been actively participating in the various leprosy control schemes.

Recent advances in the knowledge and cure of leprosy give further ground for hope that the goal of eradication can be expected to be achieved within a measurable period of time.

Cancer Research

A significant breakthrough in cancer research which involves a new and rapid method of first producing and then extinguishing breast cancer in rats is reported from Chicago University.

The technique, outlined by Dr. Charles Huggins of Chicago University's Ben May Laboratory for Cancer Research, represents a number of "firsts"—

1. For the first time, a way has been found to induce cancer in all laboratory animals tested, something not previously possible.

2. For the first time, a way has been found to extinguish, not just suppress, cancer in laboratory animals.

3. Producing and eradicating the cancer takes just over three months. Previously in work with mice it took up to two years to demonstrate this.

4. Most important, it offers science a "ready-made" tool to evaluate drugs for their anti-cancer effect against breast tumours in human beings, where time is important.

The experiment

The report said a single feeding by mouth of 20 milligrams of the compound DMBA to a strain of albino rats produced mammary cancer in all 500 by the time they were 50 days old. Some of the rats developed the cancer within 15 days. At age 65 days, they were given the overian hormone progesterone, and by age 90 days the tumours had disappeared in two out of 10 and eventually in all the rats. Rats given injections of pituitary hormones at age 65 days, or made pregnant, experienced very rapid spreading of the breast cancer.

Huggins said the method is a "wonderful tool" to test both carcinogens (cancer causers) and drugs for their anti-cancer potency. He said screening of cancer drugs might be speeded several hundred-fold by the new method.

A method that may make it possible to predict a person's susceptibility to heart attacks, even when no symptoms of such a condition are evident, has been developed by an American physician who injects radioisotopes into the heart to test the rate at which the blood flows through it. In a diseased heart, the blood flow is decreased by as much as 50 per cent, it is claimed.

The need for a simple diagnostic device in this field has been very great. At present the determination of blood flow in a diseased heart involves a somewhat hazardous and expensive procedure which requires the installation of tubes or catheters into the heart. The American physician claims this method is simple, non-harmful, and no more difficult to do or to interpret than a simple X-ray examination.

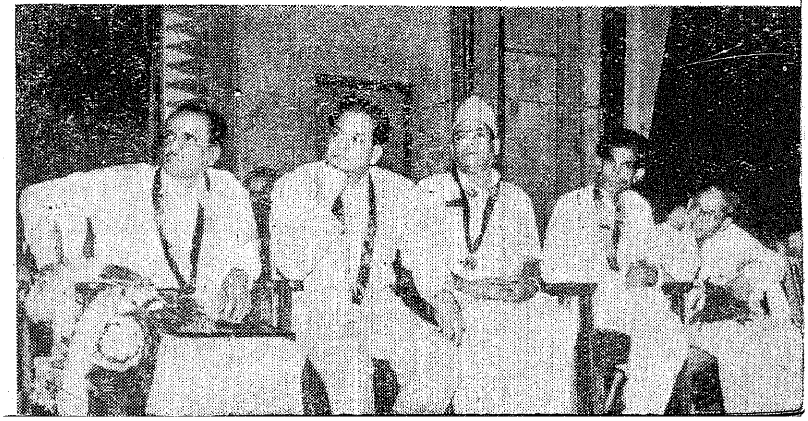
Dissolving the blood clot

A doctor of the Cornell University Medical College, in the United States has succeeded after a seven-year study in isolating an enzyme which may be the long-needed substance that dissolves human blood clots that have formed and threaten death.

The enzyme, which is found in human blood, is called fibrinolysin. While the doctor and his associates have given injections of fibrinolysin to only 45 men and women suffering from critical heart ailments, 39 survived. The remaining six were in a state of shock or of a hopeless heart condition before appearing for treatment.

The doctor said recently that injections of fibrinolysin would usually be given only in an emergency and that, although the enzyme might save many lives, it would not always be successful.

Other State Natak Sangham Award Winners.



It is hoped that fibrinolysin will also be helpful in other ailments besides heart conditions that involve blood clots. Among these are phlebitis, an inflammation of vein, to which young mothers are sometimes subject.

New Hormone

Dr. Daniel Rudman of the Goldwater Memorial Hospital in New York City has discovered a new pituitary hormone, which tests have shown to be more powerful than the well-known ACTH in making fat move in or out of body tissues.

Further experimental work with the new hormone, which is as yet unnamed, may yield new facts concerning the cause of atherosclerosis, a widespread form of hardening of the arteries, which is now under intensive study in the United States.

For the time being the new hormone is being called "Fraction L." . It has the properties of a protein, made up of a long sequence of amino acids. It will not be finally named until more is known about its biologic actions.

Electric Anaesthesia

Electricity has been successfully used on two patients to produce anaesthesia during surgical operations, *The Journal of the American Medical Association* has reported.

It is believed that these two cases are the first in which controlled electric current has been used as an anaesthetic in any successful major surgery, according to the authors of the report. They say that two advantages of the use of electricity are the rapid recovery of the patients and the absence of after-effects from the anaesthesia. The method warrants further study, they believe.

The operations for which the electric method were used were performed at the University Hospital of the University of Mississippi Medical Centre at Jackson, Mississippi.

The Third Plan

The Second Five-Year Plan has ended and on April 1, the country stepped into the Third Plan after a decade of planned development. The draft outline of the Third Plan has already been approved by Parliament and it is likely to be published in its final form quite soon. Work on the Plan, however, has started from April 1.

In the course of the 10 years of planning, the country's national income has gone up by 40 per cent. In spite of the 2 per cent rise in the population per year, the income per capital has risen by 19 per cent. Industrial production is up by 70 per cent and agricultural output by more than 33 per cent. In the field of consumption also there have been substantial rises. The consumption of foodgrains, for example, has gone up from 13·9 ounces to 16.4 ounces per head and of cloth from about 13 yards to 16 yards. Sugar consumption has increased by 78 per cent per head and the consumption of soap by 80 per cent. The social services have made considerable progress. There are 50 per cent more hospitals in the country today than in 1950–51. Six out of every 10 children now go to school. Diseases like malaria which used to take a heavy toll are in the process of being completely eradicated. Expectation of life has gone up and the death rate has fallen. The great tempo of development that has been created is reflected in the size of the Third Plan with an outlay more than 50 per cent higher than that of the Second Plan. The Third Plan is designed to increase the national income by 5 per cent every year and it aims at creating an industrial base in the country which is essential for self-sustaining growth.

Madras Pays Homage to Rabindranath Tagore

M. KRISHNASWAMI, *Secretary, the Madras State Tagore Centenary Committee.*

Rabindranath Tagore has been universally recognized as one of the greatest lyric poets the world has seen. There is not a single mode of literary expression which he has not used with conspicuous success. Supreme as a poet, he is hardly less so in his novels, short stories, his plays, social and allegorical in prose and verse, in his essays on social, political, philosophical and religious subjects, in his exquisite letters, in his illuminating literary criticisms, in his delightful books for children, in his autobiographical memoirs, etc.

Lofty personality

Rabindranath's range and depth as a writer are but one manifestation of his rich and lofty personality and it is perfectly true to say of him that he is greater even than his own creations. It is a mistake to think any one manifestation of Tagore's creativeness as isolated. Through all that he did—his writings, his compositions, his great work for Visvabharathi and Santiniketan, his fight against injustice and oppression in any shape or form, his part in the national struggle for freedom, his many travels in the east and west carrying the message of India to the people of the world, his close association with men of the highest stature in every land—rang an unmistakeable note of unity and harmony.

Manifold gifts

It is, indeed, a rare phenomenon for a single person to be endowed with such manifold gifts. By the greatness of his achievements and the majesty of his personality, he dominated his age and influenced the people of his race in every sphere of their lives. The eminent German philosopher Count Hermann Keyserling paid his tribute to Tagore in the following words: " There has been no one like him on our globe for many and many centuries. He is the creator of a Nation. I admire my great friend Rabindranath as I admire no other living man, because he is the most universal, the most encompassing, the most complete human being I have known ".

Centenary in City

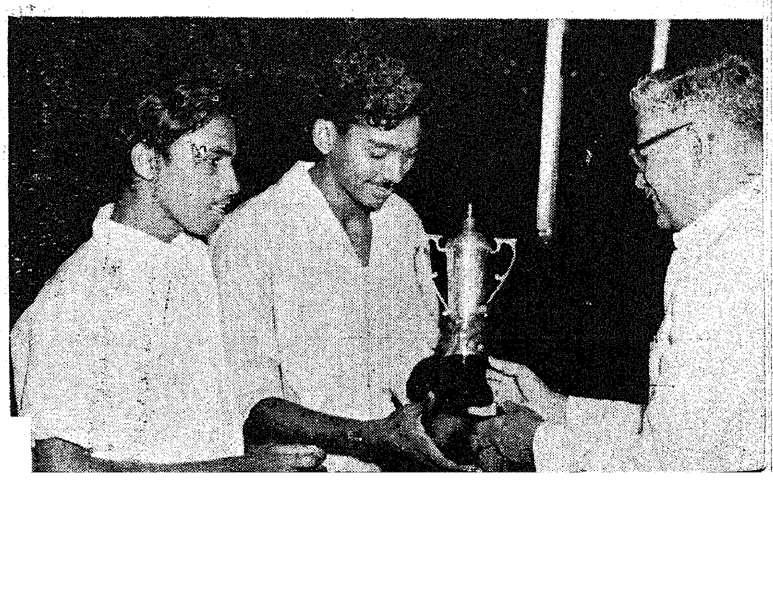
Rabindranath Tagore visited Madras three times and Madras cherishes vivid memories of the poet's visit to the City. The Government of Madras constituted a very influential Committee with the Governor of Madras and the Chief Minister as Chairman and Vice-Chairman, respectively and organized centenary celebrations in May on a statewide basis. Under the guidance of Smt. Rukmini Devi, well-known exponent of Bharatanatyam and the Director of Kalakshetra, a very ambitious and colourful programme was drawn up. The celebrations in Madras were inaugurated on May 12 by Dr. S. Radhakrishnan at Rajaji Hall. Sri C. Subramaniam, the Finance Minister presided over the function. Kalakshetra provided a dance-drama as part of the programme on the occasion. A short programme of Rabindra Sangeeth by the Bengali Association and Nagaswaram recital by a reputed Vidhwan were some of the highlights of the cultural programme on the day.

Play Production

The Committee has drawn up a programme to produce Tagore's plays in various languages. Leading institutions like Kalakshetra, Bengalee Association, Samskrita Ranga, Madras Natya Sangh, Madras Players, Andhra Maha Sabha, Kerala Samaj, Amateur Theatre Federation and Karnataka Sangh have agreed to produce Tagore's plays. It has been decided to conduct a course on Tagore's music in July with the help of a well-known exponent of Rabindra Sangeeth. Kalakshetra, described as the Shantiniketan of South India, is going ahead with the programme of production of a dance-drama. It is proposed to translate the Tagore Centenary volume into Tamil. Scholarships will be awarded to a few students for advanced courses in painting at Shantiniketan.

The Tagore Centenary Celebrations were arranged in every district of the State and varied cultural programmes were gone through at every centre. The festivals generated great rejoicing and enthusiasm among the public and the State seemed not to lag a whit behind any in its Homage to the National Poet.

Industries Minister Venkataraman presided and distributed prizes on the Hostel Day of the Central Polytechnic recently. In the picture he is seen giving away a trophy.



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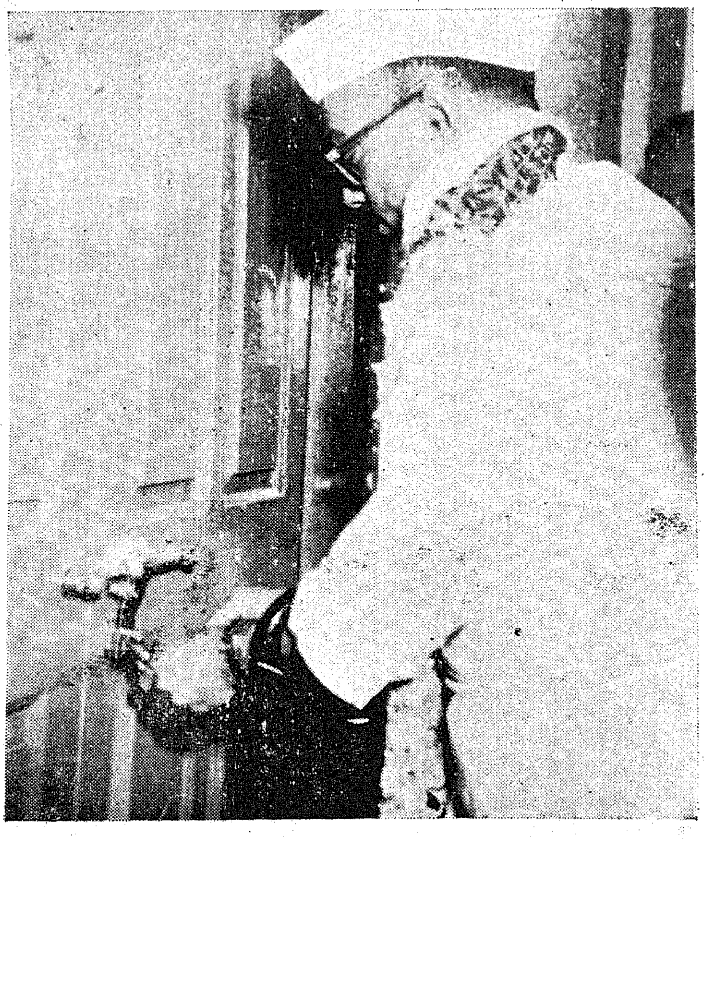
The Fight Against Rinderpest

[Conservation of cattle-wealth is of paramount importance in a country like India whose economy is predominantly agricultural. In this task, the fight against Rinderpest is of vital significance since this disease is the greatest single factor responsible for cattle loss in India. This article gives a brief account of the history of the disease and measures taken to eradicate it since 1954 when a pilot project for the purpose was inaugurated under the First Five-Year Plan]

Of the contagious diseases that affect cattle, rinderpest is the most serious. Its main characterestics are fever and inflammatory lesions of the mucous membranes and the gastro-intestinal tract. It is estimated that 200,000 animals die of this scourge every year. Those which survive after an attack are generally unfit for work, breeding or milk production. The annual financial loss in India is estimated at Rs. 30 to 35 crores.

The Union Minister for Community Development, Sri S K Dey, recently opened the Council Hall of the Panchayat Union at Uttiramerur



Commonly known as "cattle plague", rinderpest was introduced from China into western Asia early in the first century A.D. It then spread to Europe and Africa. It was eradicated from Europe by the end of the 19th century. It is endemic in the Soviet Union, India and other Asian countries and Africa and has been recognized as a contagious disease from the 18th century. It is transmitted by direct contact of diseased animals with healthy ones or indirectly through the medium of food, water, clothing, utensils and hides freshly contaminated with infectious discharge.

Immunisation methods

Research on rinderpest began over 55 years ago, and various methods for the immunisation of animals against the disease have been developed. Among these are the goat-virus methods of vaccination. Goat-adapted virus vaccine was developed at the Indian Veterinary Research Institute, Mukteswar, in 1927 and has been widely used against rinderpest in India and Africa.

While goat-virus vaccine is safe for immunising animals with some degree of natural resistance, it produces undesirable reactions in fully susceptible animals, such as European cross-bred and hill-cattle. Passage of the virus through other types of animals showed that the rabbit was the suitable animal for this purpose. This led to the production of lapinized virus vaccine which can be used satisfactorily on highly susceptible animals without ill-effects. For the control of rinderpest today, we have these highly efficient virus vaccines which are relatively easy to produce on a large scale.

Eradication scheme

The programme of rinderpest eradication in India is one of gigantic proportions because of our large livestock population. The cattle and buffalo population in 1956

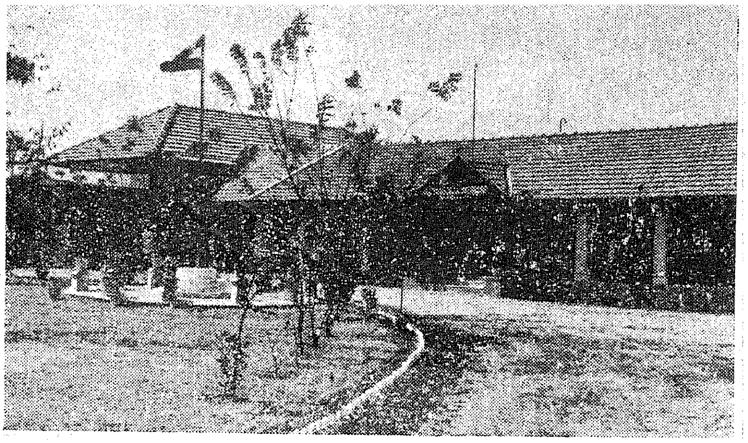
was 158,863,000 and 44,766,000 respectively—1/5th of the world cattle population and 1/2 of the buffalo population.

The Rinderpest Eradication Scheme was begun as a pilot project in 1954 under the First Five-Year Plan. To begin with, the area south of the Krishna River, in the States of Kerala, Mysore, Madras, Andhra Pradesh and Bombay was brought under the campaign. During 18 months of the First Five-Year Plan, six million head of cattle and buffaloes were vaccinated. This encouraged the Government to extend the scheme to all other States in the country.

Vaccine production

At present there are six vaccine production centres—at Izatnagar (U.P.), Calcutta, Lucknow, Ranipet (Madras), Hissar (Punjab) and Mhow (Madhya Pradesh). They produce adequate quantities of vaccine for use in India. Supplies have also been made to neighbouring countries—Nepal, Pakistan and Afghanistan.

In the first five years of the Rinderpest Eradication Campaign, 132,554,000 doses of vaccine had been produced and over 68,000,000 head of cattle and buffaloes vaccinated. The States of Mysore, Andhra Pradesh, Maharashtra, Bihar, Delhi, Himachal Pradesh completed the work by March 31, 1961. The work of eradication in other States is likely to be completed by the end of the third year of the Third Five-Year Plan.



The Uttiramerur Panchayat Union Office

There is constant danger of the disease being brought in by animals from neighbouring countries. To prevent this, a number of land quarantine stations have been established, especially on the border with Nepal. All along the border, a 10–20 mile-deep 'immune belt' is being established by vaccinating all the animals in the area.

Projects to help landless labour

A sum of about Rs. 21 crores has been provided in the Third Plan for directly helping landless labour to settle on land. This was stated by Shri Shriman Narayan, member of the Planning Commission in New Delhi, while addressing the first meeting of the Central Advisory Committee on Agricultural Labour. He said it was proposed to distribute about 50 lakhs acres of land to seven lakh families of landless labourers in different States. As far as possible, lands proposed to be distributed would be unreclaimed, and the allottees would be given assistance for the purchase of bullocks and implements.

The Advisory Committee, among other things, recommended a programme for the provision of house-sites to 50 lakh families, free of cost, out of available Government lands or sites specially acquired for this purpose at a cost of Rs. 10 crores. Assistance was also recommended for the construction of houses.

The Committee laid great emphasis on augmenting special works programmes for providing employment to the unemployed and underemployed in the rural areas. In this connection, the Committee was apprised of the 34 Pilot projects, recently sanctioned by the Planning Commission, for the utilization of rural manpower on productive works and works of public utility.

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